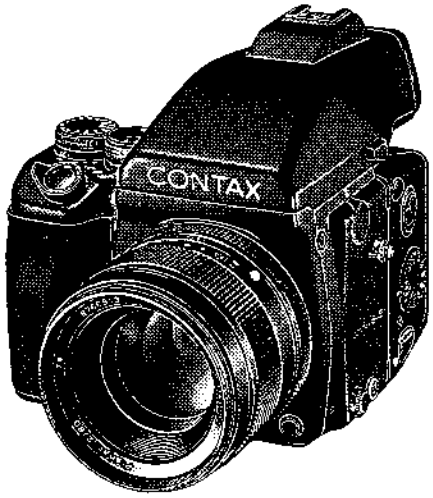
KYOCERA

NO.	419-01-41-RA1AU01

CONTAX 645

Repair Manual



KYOCERA CORPORATION
Optical Equipment Group
Service Dept. 1AU991020

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A. GENERAL & TECHNICAL INFORMATION

FEATURES

This CONTAX 645 camera is an SLR autofocus system camera for the 6 × 4.5cm format.
The camera body, lens and film back are controlled by the respective microcomputers so that each of such components operates independently. Since the camera has no mechanical coupling between the components, the system is excellent in reliability and will be flexible in coping with future system extension.

1. Autofocus System

The TTL area sensor system has a 1/5-inch, 250,000-pixel autofocus CCD sensor with four horizontal and two vertical lines.
The AF mechanism is driven with the motor incorporated in the lens. Even while the AF mechanism is being driven in focus lock mode, the dual focusing mechanism allows the photographer to set Manual Focusing by turning directly the focusing ring of the lens and thus to make fine adjustments for focusing.

2. Shutter

The newly developed high-speed focal plane shutter realizes the highest speed of 1/4000 second, which is the first to appear in the middle-format camera market, and a flash synchronization speed of 1/125 second.

3. Real Time Vacuum System

The Real Time Vacuum System, in combination with the ceramic pressure plate, ensures a reliable, high-precision film flatness.

4. Exposure System

The exposure system incorporates two metering systems, namely, center-weighted average metering and spot metering, and three exposure modes, namely, aperture-priority AE, shutter-speed -priority AE and manual exposure. In addition, it is also provided with Automatic Bracketing Control (A.B.C.) mechanism, which permits three-frame continuous automatic exposure compensation.

5. TTL Flash Auto Control

The built-in Pre-Flash TTL Automatic Flash Meter, which is a reflected light type, permits light metering by firing the flash independently.
With a CONTAX TLA flash unit, the amount of flash indicated as a result of pre-flash is stored in memory so that the photographer can control the exposure freely by adjusting the aperture for subsequent shots.
The camera is equipped with a flash automatic setting mechanism; when the dedicated flash unit (TLA 360) has been mounted on the accessory shoe on the Prism Finder, the camera sends the information about the film speed, aperture value and lens focal length to the flash unit.

6. Other Functions

- Film speed can automatically be set by scanning the bar code used on Fuji Film.
- The camera has a function to record photographic data, such as aperture value, shutter speed, exposure compensation value, exposure mode, lens name and film type, outside the frame.
- The AE Prism Finder with an integrated diopter adjuster and Waist Level Finder are available.
- With any of the series lenses, the aperture is controlled in 1/8 steps with the stepping motor incorporated in the lens.

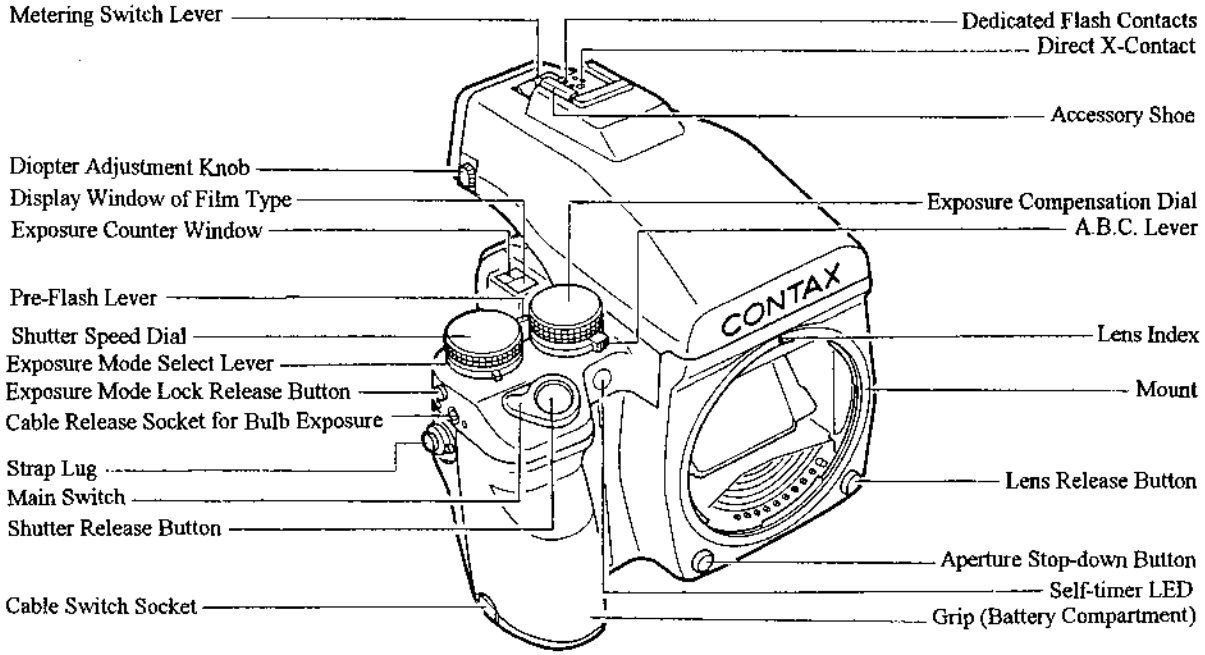
SPECIFICATIONS

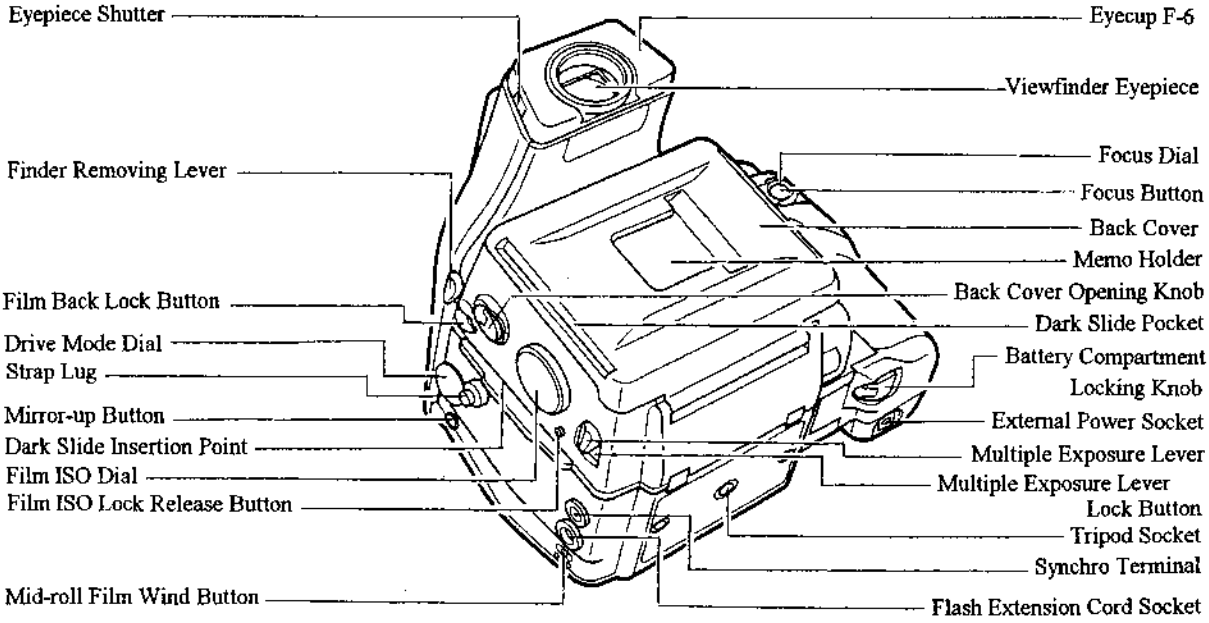
Camera Type	: 6×4.5cm format focal-plane shutter AF SLR
Actual negative size	: 56mm×41.5mm
Lens mount	: CONTAX 645 bayonet mount
Shutter	: Vertical-travel metal focal-plane shutter
Shutter Speeds	: Av (Auto) : 32 sec. ~ 1/4000 sec. Tv (Setting Value) : 8 sec. ~ 1/4000 sec. Manual : B, X (1/90 sec.), Mechanical Bulb, 8 sec. ~ 1/4000 sec.
Synch Contacts	: Direct X contact (synchronizes at 1/125 sec. or slower) and sync terminal
Self-timer	: Electronic self-timer with 2 or 10 sec. delay
Shutter Release	: Electromagnetic release, dedicated release socket, and cable release socket for bulb exposure
Exposure Modes	: ① Aperture-priority auto exposure : ② Shutter-speed-priority auto exposure ③ Manual exposure ④ TTL auto-flash ⑤ Pre-flash TTL automatic flash ⑥ Pre-flash TTL manual flash
Metering System	: TTL spot metering (standard equipped), Center-weighted average light metering (when prism fider is equipped.)
Metering Range	: EV3 ~ EV18 on spot metering and EV1 ~ EV21 on center-weighted average light metering (ISO 100/F2.0)
Film Speed Range	: ISO 25 ~ 5000 on Automatic setting with DX code, ISO 6 ~ 6400 on manual setting.
AE Lock	: The quantity of light on the image surface is stored in memory
Exposure compensation	: +2 EV ~ -2EV (can be set in 1/3 step increments.)
A.B.C. Unit	: ±0.5EV and ±1 EV exposure compensating values
Flash Light Control	: TTL direct flash metering
Flash Synchronization Control	: Automatic shutter speed setting when flashes charging is completed on dedicated flash units.
Automatic Flash Setting	: Possible in combination with dedicated flash capable of automatic flash setting.
Second Curtain Synchronization	: Possible in combination with dedicated flash capable of second curtain synchronization
Viewfinder	: Interchangeable TTL finder (AE Prism finder, Waist Level Finder) Field of view : 95% When AE Prism Finder is equipped: Magnification: 0.8X (With 80mm normal lens at infinity, -1D dip.)
Diopter Adjustment	: When AE Prism Finder is equipped: Built-in diopter adjuster, -2D ~ +1D
Focusing screen	: Sectioned Matte (Standard) Interchangeable screens are available.
Display in Viewfinder	: Battery Warning Mark, Exposure Counter/self-timer remaining time/A.B.C. Mode/film end, exposure metering mark, flash mark, focusing mark, aperture value, shutter speed, exposure meter
Film Loading	: Semi-automatic loading to match 'start position mark', film automatically advances to "01" on exposure counter
Film advance	: Automatic winding with built-in motor.

Film Rewinding	: Automatic rewinding with built-in motor, automatic stop and mid-roll rewinding possible.
Drive Modes	: Single frame, continuous, self-timer (2 sec. , 10 sec.)
Multi-exposure	: Setting with Multi-Exposure Lever
Winding speed	: Up to approx. 1.6 frames/sec. on continuous shooting ("C" mode) (with a new battery, at ordinary temperature, as tested according to CONTAX testing standard.)
Exposure counter	: Automatically resetting, additive type.
Accessory shoe	: Direct X-contact (provided with TLA flash contact)
Data recording function	: Record photographic data outside the frame. The contens of recording : F-stop, shutter speed, exposure compensation value, exposure mode, type of lens, film type
Power Source	: One 2CR5 6V-lithium battery
Battery Check	: Automatic check, Display in viewfinder
Battery Capacity	: About 30 rolls of 120 film (with a new battery, at ordinary temperature, as tested according to CONTAX testing standard)
Other details	: Aperture stop-down button Mirror-up feature
Dimension,weight :	
Camera body	: 141 (W) × 99 (H) × 73 (D) mm 645g (without battery)
Camera body with AE prism finder, film back holder; 120/220 film insert	: 141 (W) × 138.5 (H) × 145.5 (D) mm 1,370g (without battery)

* Specifications and design are subject to change without notice.

NAMES OF PARTS

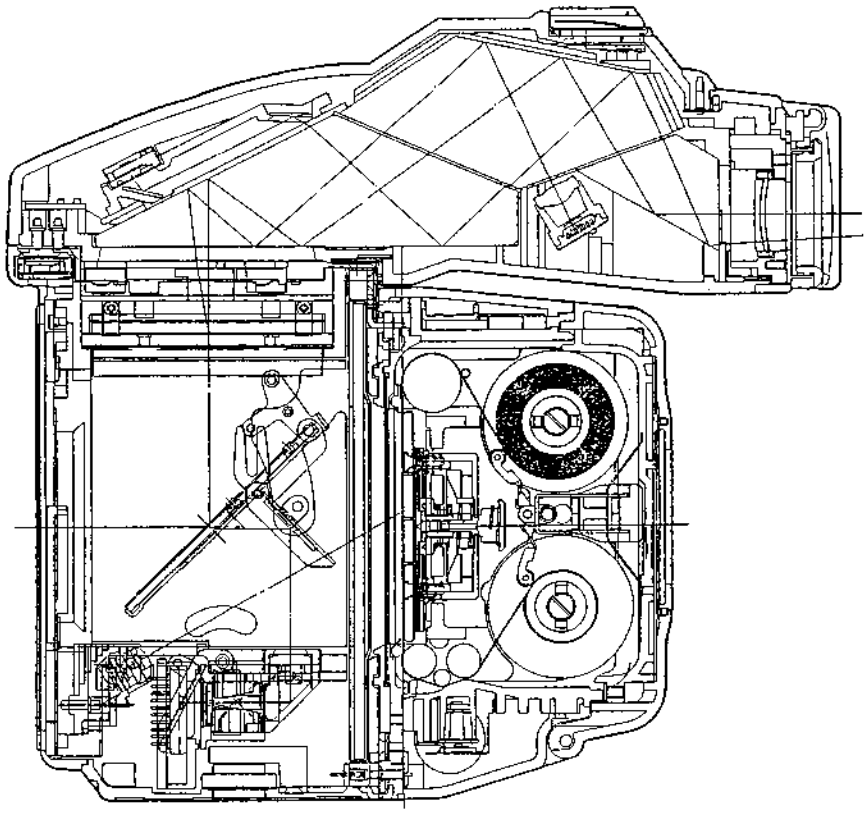




DESCRIPTION OF MECHANISMS

1. Overall Structure

This camera, roughly speaking, consists of the camera body, Film Back section and finder.
The camera body is composed of ① lens mount, ② film back mount, ③ finder mount, ④ focusing screen attaching and removing mechanism, ⑤ shutter, ⑥ shutter charge mechanism, ⑦ shutter trigger release mechanism, ⑧ finder mirror, ⑨ AF module mirror, ⑩ mirror quick return mechanism, ⑪ mirror charge mechanism, ⑫ AF module, ⑬ TTL Flash Auto control module, ⑭ viewfinder display, ⑮ grip, and others.
The Film Back section includes the mechanisms for ① film winding, ② film bar code reading, ③ photographic data imprinting, ④ exposure counter, ⑤ film speed setting, and ⑥ multiple exposure setting.
The AE Prism Finder consists of ① viewfinder display, ② viewfinder diopter adjusting mechanism, ③ eyepiece shutter, ④ built-in light metering sensor for average light metering, ⑤ lever for switching between average light metering and spot metering on the camera body, ⑥ accessory shoe, and ⑦ finder lock mechanism.



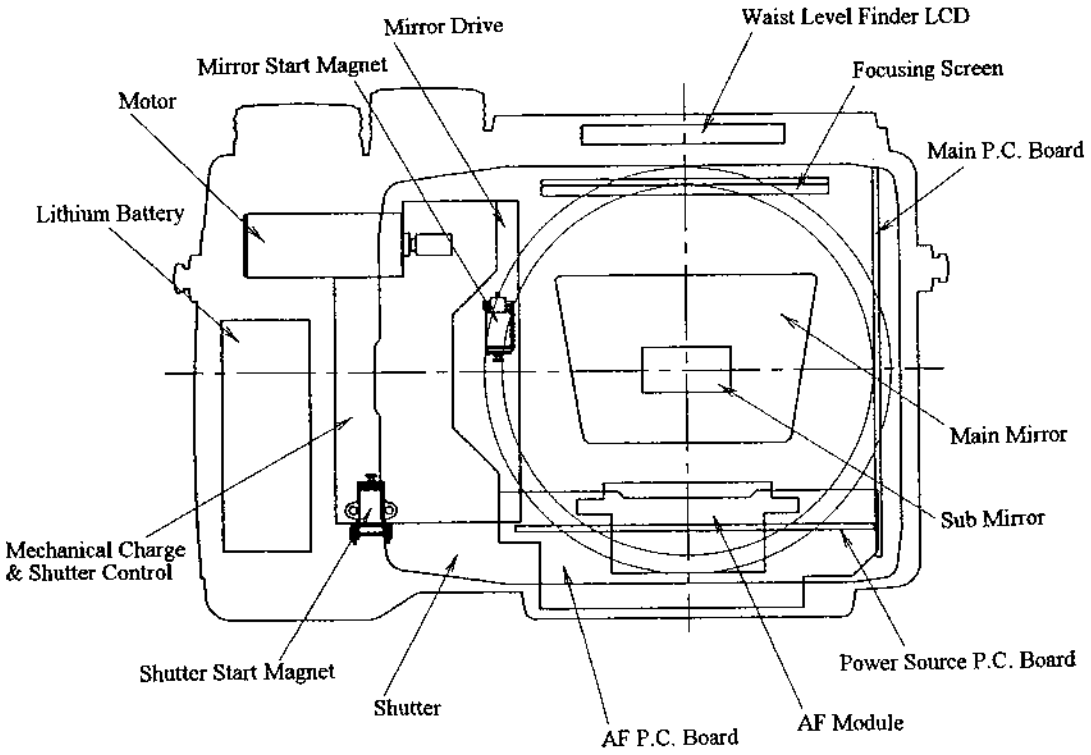
2. Major Mechanisms in Camera Body

< Mechanisms in Camera Body >

This camera controls the Shutter and the Mirror by means of a high-performance coreless motor and two Start Magnets,. The two magnets, namely, the Mirror Start Magnet and the Shutter Start Magnet, are used to realize the electrically driven Mirror-up Mechanism.

Mirror-up motion is activated by operating only the Mirror Start Magnet. Mirror resetting is driven by the motor with the Shutter kept closed, so that film will not be wasted. During mirror-up motion, the lens is stopped down to the minimum aperture to enhance light shielding performance.

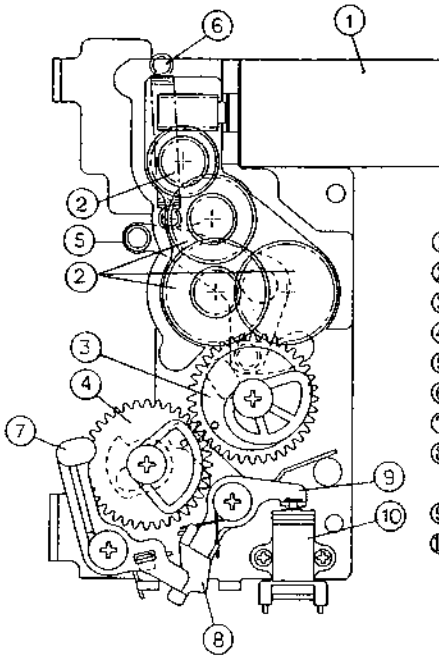
In normal shooting sequence, the Mirror Start Magnet and the Shutter Start Magnet are operated in the named order to start mirror-up motion and release the trigger of the shutter.



(Layout of Units in the Body)

< Mechanical Charge & Shutter Control >

The Mechanical Charge & Shutter Control mechanism is located on the front of the Shutter. In the control of the Shutter by use of two magnets, the Shutter Start Magnet is operated first to release the trigger of the shutter and then shutter operation is controlled electrically. Immediately after the travel of the shutter curtains, the motor starts running and the two cams installed on both sides of a gear charge the Mirror Driving Spring and then the Shutter. At the same time, the cam installed on another gear charges the Shutter Start Magnet. The timing switch operated by the cam stops the motion of the mechanism by applying a short brake to the motor.



① Charge Motor
② Charge Gear Train
③ Charge Cam (1)
④ Charge Cam (2)
⑤ M. Charge Lever
⑥ M. Charge Spring
⑦ Release Lever
⑧ Release Charge Lever
⑨ Release Mg Lever
⑩ Shutter Start Magnet

(Charge Mechanism)

< Mirror Drive >

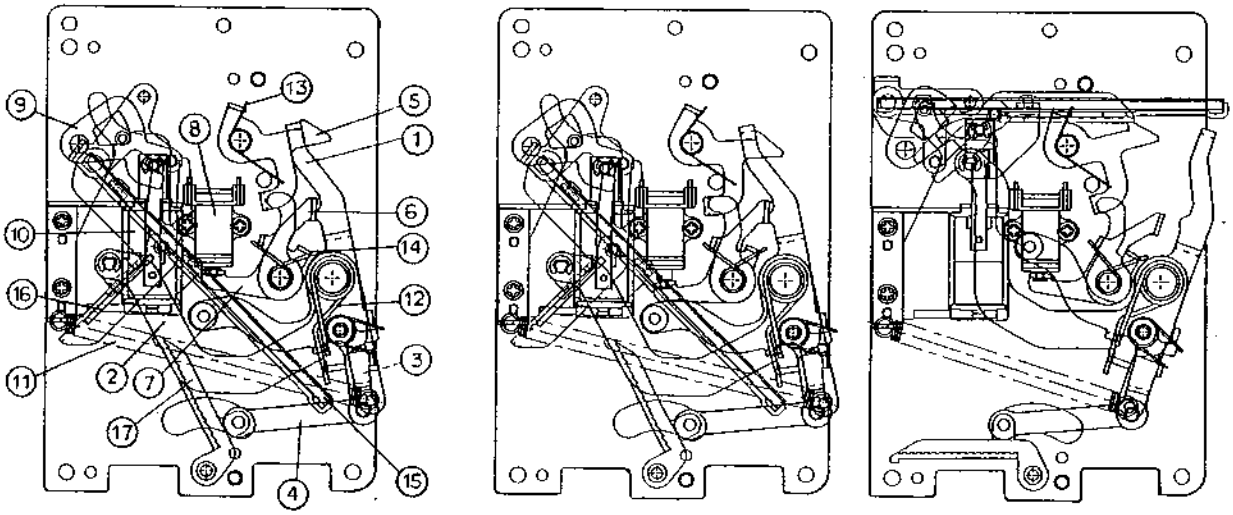
The Mirror Driving Mechanism is located at the side of the Mount Base. Mirror up is achieved by the force of the Mirror Driving Spring once the Mirror is unhooked by the operation of the Mirror Start Magnet. Mirror down is achieved by the force of the spring coupled with the motion of hooking the lever by the Mechanical Charge Mechanism. This mechanism contains an air damper to reduce the impact caused by mirror motion.

(Mirror Drive Mechanism)

Release wait status
Mirror : in the DOWN position
Light-Shield Plate : in the UP position
Magnet : in the attraction state
Hook : with the lever hooked

Magnet energized status
Mirror : in the DOWN position
Light-Shield Plate : in the UP position
Magnet : in the repelling state
Hook : with the lever unhooked

Mirror up status
Mirror : in the UP position
Light-Shield Plate : in the DOWN position
Magnet : in the attraction state
Hook : ready for hooking

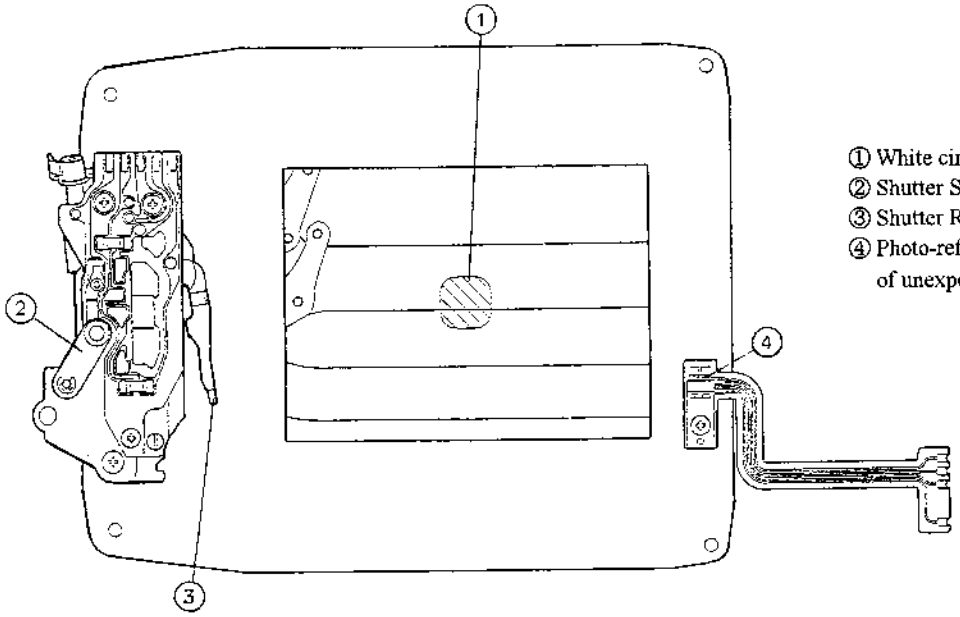


① Mirror Driving Lever
② Mirror Up Lever
③ P. Plate Driving Lever
④ P. Plate Coupling Lever
⑤ Mirror Start Lever
⑥ Mg Charge Lever
⑦ Mirror Mg Lever
⑧ Mirror Start Magnet
⑨ AD Lever
⑩ Air Damper Unit
⑪ Mirror Up Spring
⑫ Mirror Down Spring
⑬ Mirror Start Spring
⑭ Mg Charge Spring
⑮ Main Mirror
⑯ Sub Mirror
⑰ Light-Shield Plate

< Shutter >

The shutter is an electronically controlled vertical travel focal plane shutter.
The shutter consists of the basic configuration based on the control section of the existing 1/12000 second shutter and the newly developed large-sized shutter curtains and driving arm. Thanks to the high-torque control section, the shutter realizes the maximum shutter speed of 1/4000 second and a flash synchronization speed of 1/125 second.
In addition, the shutter has the following features:

- The center area of the first curtain is coated in white to pre-flash TTL light metering.
- The shutter is equipped with a photo-reflector to detect unexposure.
- The X Contact is driven by the signal from the photo-reflector.
- The shutter triggeres itself and starts operating upon release by the Release Lever.
- The Setting Lever, on the bearing, is charged directly by the cam.



① White circle for pre-flash
② Shutter Setting Lever
③ Shutter Release Lever
④ Photo-reflector for detection of unexposure

(Shutter Unit)

< Auto Focus >

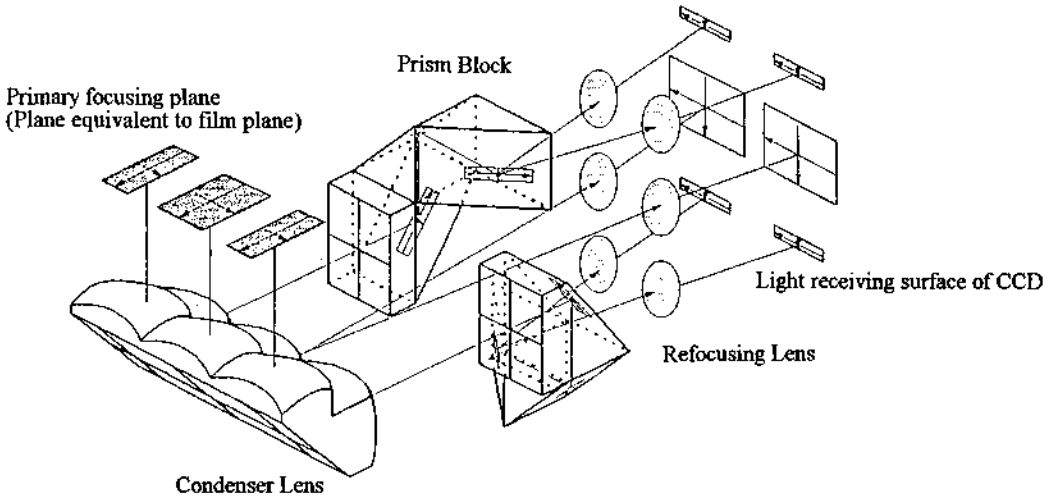
① AF System

To ensure both a wide AF area and a high AF accuracy, the AF System employs a TTL phase difference detection method by use of the 1/5-inch 250,000-pixel CCD area sensor.
The AF optical system is constructed as follows : The light beam having passed through the Lens and having been transmitted by the Main Mirror is directed toward below by the total reflection Sub Mirror. Then the beam is led through the Condenser Lens, AF Prisms and Refocusing Lenses to the CCD Area AF Sensor. The light beams in both of the right and left areas are led toward 90-degree turned direction by the AF Prisms to the Area Sensor so as to achieve the auto focusing of " | — | " type.

② Arithmetic Operation and Control

AF arithmetic operation is carried out by dividing the subject area into six areas, i.e. central areas (four horizontal lines) and right and left areas (one vertical line for each). In arithmetic operation, emphasis is placed on the central areas. That is, the arithmetic operation for the side areas plays a complementary role only when adequate contrast can not be obtained only by the arithmetic operation for the central areas.
Compared with the conventional arithmetic operation system, this system incorporates a greatly increased number of arithmetic operation lines and pixels to realize a higher-precision AF computation. Even with such a high accuracy, however, this system realizes as short an AF calculation time as the conventional system does, thanks to use of a 32-bit high-speed RISC microcomputer with a reference clock frequency of 20 MHz and execution of analog integration processing at data transfer from the CCD. Moreover, corrective operation based on aberration information on the individual lenses is performed to derive the full performance of each lens.

(AF Optical System)



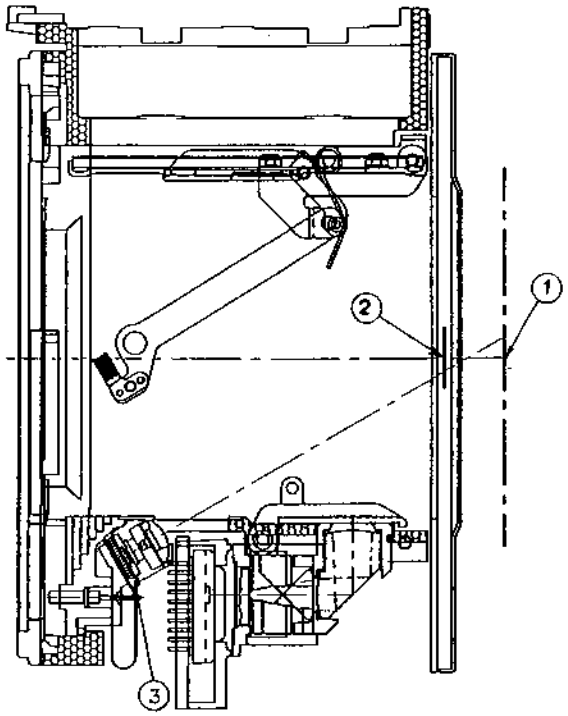
< Spot Light Metering >

The Spot Metering Sensor shares the center area of the CCD Area Sensor for AF. If the light metering sensor and AF sensor are located separately, the light beam must be divided into two which are sent to the two sensors, respectively. Such a system sacrifices the amount of incident light to each sensor and the amount of transmitted light to the viewfinder. In this camera, however, sharing of the sensor contributes to an effective use of the light beam and constitution of a small-sized, lightweight body. In addition, since this sensor is incorporated in the camera body, AE control achieved by spot light metering is allowed even with the Waist Level Finder mounted.
Spot light metering applies to the circular zone of ϕ 5.5 mm at the center of the image screen.

< Pre-flash Meter >

The Pre-flash Meter has the same mechanism as that mounted on CONTAX RTS III.
Turning the Pre-flash Lever ON activates mirror up, aperture stop-down and flash firing. The light reflected by the center area of ϕ 8 mm on the shutter curtain is metered by a photodiode. This light metering result is displayed on an analog scale in the range of ± 2 EV in the viewfinder. Since this display changes with a change in aperture, the photographer can easily set an intended exposure.
In Pre-flash TTL Automatic Flash mode, the amount of flash is controlled by pre-flash and simultaneously the calculated flash duration is stored in memory. The duration of main flash will be controlled to be exactly the same as the calculated flash duration kept in memory.
The light metering value and calculated flash duration obtained by pre-flash are stored in EEPROM and thus kept even during battery replacement so as to permit successive shooting. Turning the Pre-Flash Lever OFF will restore the conventional TTL direct flash metering control.

(Sectional View of Mount Base)



① Film plane
② White circle on shutter curtain
③ TTL Direct Flash Metering IC

< Viewfinder Display >

This camera, without any external LCD panel, uses only the viewfinder display to inform the user of the camera status data.

For viewfinder display, a transmission negative type LCD is employed and the brightness of the Back Light LED is changed in three steps according to the brightness (light metering result) of the subject to ensure an always easy-to-see display.

The display includes the Battery Warning Mark, Exposure Counter, Metering Mark, Flash Mark, Aperture Value, Shutter Speed, Focusing Mark and pre-flash metering result.

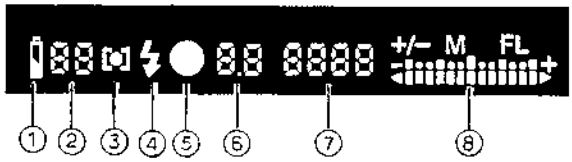
The display on the analog scale indicates the difference in exposure from the metering value in exposure mode M, X or B or the amount of exposure compensation in exposure mode Av or Tv. It also indicates the metering result when the pre-flash is fired. The same information is also displayed in the AE Prism Finder.

The viewfinder display lights up when one of the following operations takes place, and automatically goes out 16 seconds later to save power.

① The Main Switch is turned ON.

② The Shutter Release Button is depressed halfway with the Main Switch turned ON.
The viewfinder display will remain on for another 16 seconds if the position of a dial or the like is changed while the display is on.

(Viewfinder Display)



① Battery Warning Mark " ▯ "

Indicates the time for replacing the battery.

" ▯ " mark not lighted	: normal operation
" ▯ " mark lighted	: Battery Warning Mark; normal operation
" ▯ " mark only blinking at 2 Hz	: no camera operation allowed

② Exposure Counter

Indicates the number of exposed frames of film. It also has the following functions :

- "- -" lighted : The Film Back is not attached.
- "0 0" lighted : Film is not loaded.
- "- E" blinking : Film winding has been completed or blank shots advance has not succeeded.
- Displays the remaining time while the self-timer is operating.
- Displays the exposure order in A.B.C. Mode.

③ Metering Mark " [•] "

" [ ] " mark lighted	: center-weighted average light metering
" [•] " mark lighted	: spot light metering
" [ ] " mark blinking	: center-weighted average light metering and AE locked
" [•] " mark blinking	: spot metering and AE locked

④ Flash Mark " ϟ "

" ϟ " mark lights up : when the flash has been fully charged during use of the TLA Flash System.
" ϟ " mark blinks for 2 seconds : after shooting, if the TTL Flash Auto control has been achieved properly.

⑤ Focusing Mark " ● "

" ● " mark lighted : The subject is in focus.
" ● " mark blinking : Focusing is impossible.

⑥ Aperture Value

Aperture value is displayed in 1/2 step increments within the aperture range of the Lens used. When the actual aperture value is between the adjacent 1/2 step values, the nearer 1/2 step value is displayed.

Example : If the actual aperture value is F 3.3, the viewfinder displays "3.5".

- In the Aperture-Priority AE (Av) or Manual Exposure (M) mode, the display shows the aperture value selected.
- In the Shutter-Speed -Priority AE (Tv) mode, the display shows the aperture value appropriate to the shutter speed selected. Also in the Shutter-Speed -Priority AE (Tv) mode, the display warns of underexposure (full-open aperture value blinking) and overexposure (minimum aperture value blinking).

* Lighting of "- -" signifies that the lens has not been mounted.
* During spot metering, an aperture value other than the full-open aperture and minimum aperture blinks if the subject is out of the metering range.

⑦ Shutter Speed

The shutter speed displayed is in the range of 1/4000 second to 32 seconds. "4000" means 1/4000 second, "125" represents 1/125 second and "8" means 8 seconds.

- When the exposure mode selected is "Av", the display shows a shutter speed in 1/2 step increments which is appropriate to the aperture value selected.
  Also in the Aperture-Priority AE mode, the display warns of underexposure ("32" blinking) and overexposure ("4000" blinking).
- When the exposure mode selected is "Tv" or "M", the display shows the shutter speed selected.
- When "X" is set, "90" is displayed.
- When "B" is set, "bulb" is displayed.

* During spot light metering, a shutter speed other than "32" and "4000" blinks if the subject is out of the metering range.

⑧ Exposure Meter

(1) In Auto exposure mode
("Tv" or "Av" mode)
Displays the amount of exposure compensation.
Example : +1.0 EV compensation

Exposure Meter

(2) In Manual exposure mode
("M" mode)
Displays the difference between the manual exposure setting value and the light metering value.
Example : 2 EV or more underexposure.

(3) When the pre-flash is fired
Flash meter is displayed.
Example : 0.7 EV overexposure

3. Major Mechanisms of Film Back

< Film Transport Mechanism >

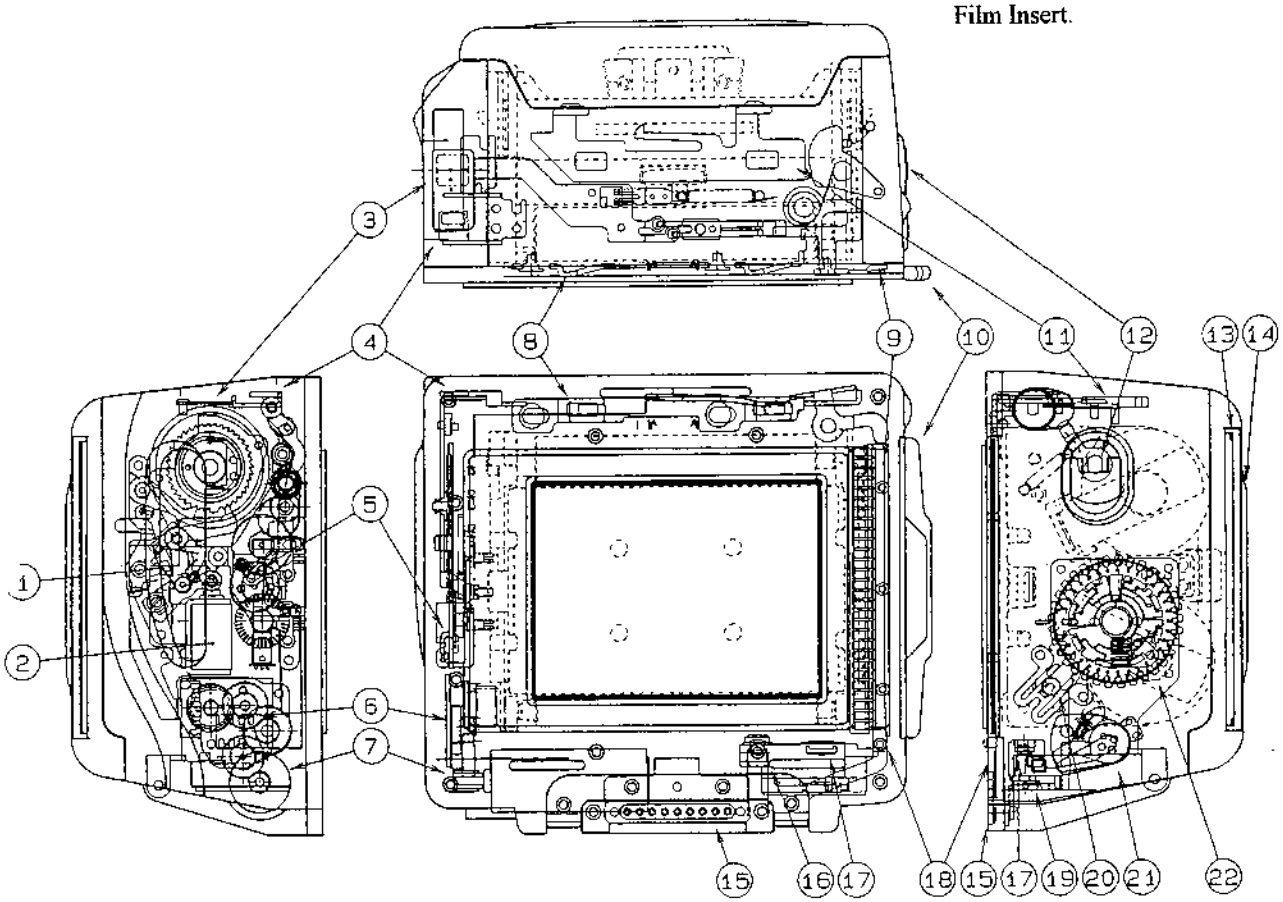
The film transport mechanism does not incorporate any mechanical connections between the Film Back and the camera body. Thus the mechanism is characterized by enhanced mechanical reliability and a reduced number of parts.

This mechanism, employing a coreless motor to be used only for film transport, realizes a film transport speed of 1.6 frames per second.

Film travel is controlled as follows : The amount of rotation of the film roller is converted to pulses by the encoder coupled with the film roller, the required film travel is detected by counting the pulses and a short brake is applied to the motor.

The film transport mechanism is assembled in a unit and the first and second gears of the reduction gear train are made of resin to ensure noise suppression.

Note : The dashed line represents the Film Insert.

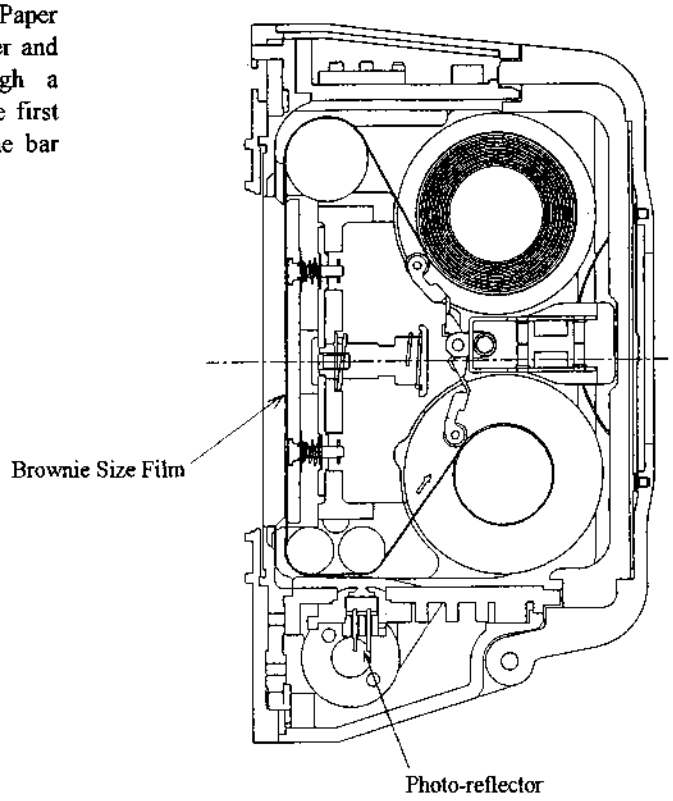


① Counter Mechanism
② Solenoid Plunger
③ Counter Display
④ 120/220 Display
⑤ Winding Encoder
⑥ Winding Reduction Gear Train
⑦ Winding Motor
⑧ Body Lock Mechanism
⑨ Dark Slide Plush
⑩ Dark Slide
⑪ Back Cover Lock
⑫ B. Lock Knob
⑬ Dark Slide Pocket
⑭ Memo Holder
⑮ BD Connect
⑯ Photo-reflector
⑰ DM Lens
⑱ Dark Slide Lock
⑲ Imprinting LED
⑳ ISO Lock Button
㉑ Multiple Exposure Lever
㉒ ISO Dial

< Auto Loading & Bar code Read Mechanism >

Blank shots advance is automatically controlled without requiring the setting of the Light-Shield Paper at the START position. The Light-Shield Paper and the film fixing tape are recognized through a photosensor to ensure that the film stops at the first frame. At the same time, the film data on the bar code film is read and ISO setting is made.

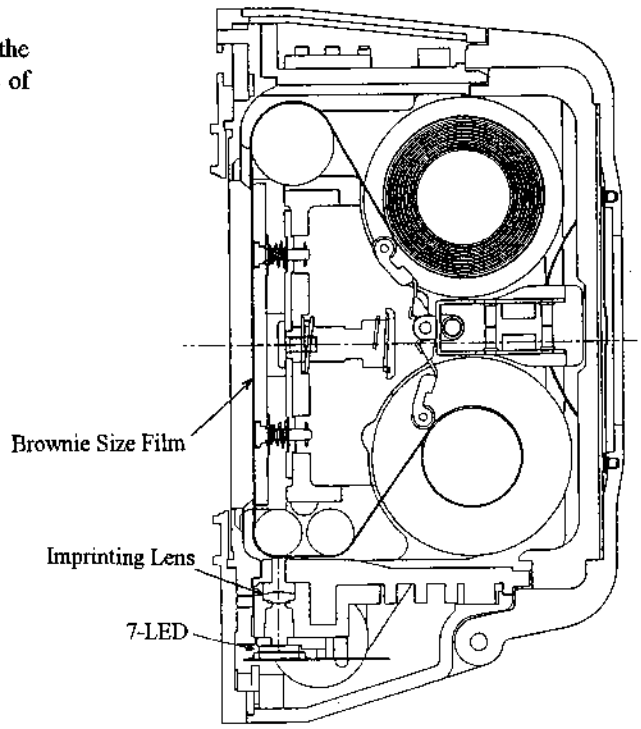
(Sectional View of Center Right Portion)



< Data Imprinting >

The camera can imprint 6 data items, namely, shutter speed, aperture value, exposure compensation value, exposure mode, name of lens used and film type.
These data are imprinted outside the frame, along the top blank of the film, avoiding impairing the value of the photography.

(Sectional View of Right Portion)



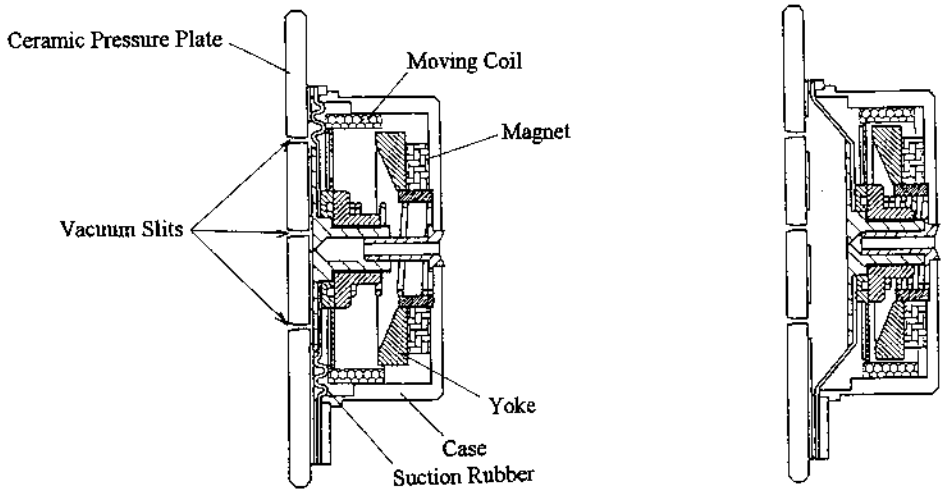
< Real Time Vacuum >

The 220 Vacuum Film Insert MFB-1B is equipped with the same Real Time Vacuum (RTV) mechanism as is used in the CONTAX RTS III.

At the moment of exposure, the film condition as to flatness characteristics varies with film type, the frame number at the exposure position and the time elapsed after winding. In addition, Brownie Size Film is more difficult to maintain the flatness than the 135 film, since the former is wider than the latter. The RTV mechanism is such that the back surface of the pressure plate is provided with a suction device which attracts the film to the pressure plate surface by creating a vacuum through the vacuum slits in the pressure plate.

The magnetic force of the coil energized makes the suction rubber retract to create a vacuum, which attracts the film to the pressure plate surface through the vacuum slits in the pressure plate. As the film is attracted to the pressure plate, the flatness of the pressure plate is also important. Accordingly, ceramic is employed as the material for the pressure plate to ensure stable performance and a flatness accuracy of 5 μ m or below.

(Sectional View of Vacuum Mechanism)



(Before Creating Vacuum) **(While Vacuum is Working)**

4. AE Prism Finder

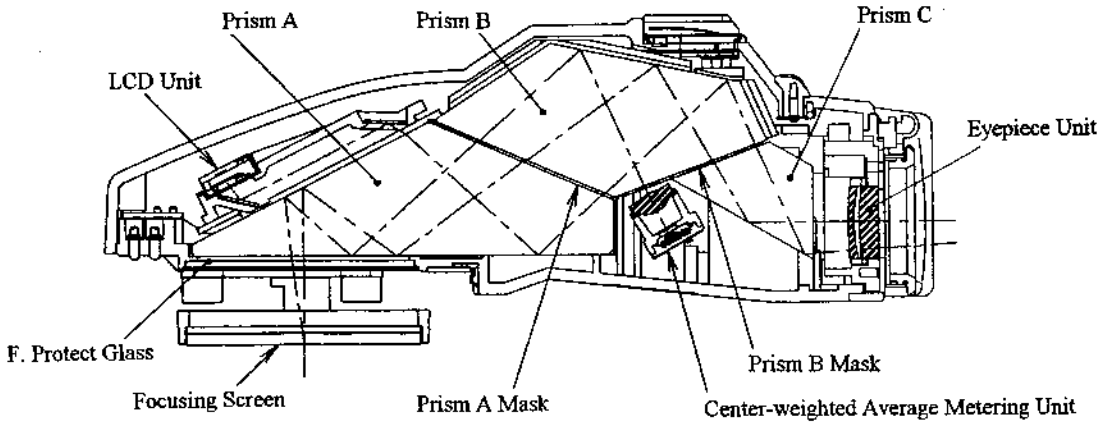
< Finder Optical System Structure >

The AE Prism Finder MF-1 consists of three prisms for realizing a high eye point of an erect real image and two eyepieces for reducing chromatic aberration. It is also provided with a dedicated LCD for viewfinder display, light metering IC and light metering optical system. Thanks to use of a deviation angle prism, roof prism and total-reflection prism, the camera is light in weight and is relatively low in total height. The reflection surfaces of the prisms are silver-coated and all the transmission surfaces of the prisms and lenses are multi-coated to ensure a viewfinder which is bright and free from ghost and flare. In this removable finder system, the incidence surface of the finder and the Focusing Screen are each protected with a glass sheet. The field of view is 95% and diopter correction ranges from – 1 to + 2 dop.

< Center-weighted Average Light Metering >

The AE Prism Finder employs center-weighted average light metering, which is suited for general photography where the major subject is situated at the center of the picture area or its vicinity. The metering range is from EV 1 to 21.

With the AE Prism Finder installed on the camera body, the photographer can select center-weighted average light metering or the spot light metering incorporated in the camera body, using the Metering Switch Lever.



(Sectional View of AE Prism Finder)

5. Electric Circuits and Parts Mounting

The electric circuit block consists of the two high-speed CPUs in the camera body, the control CPUs incorporated in the accessories (Film Back, AE Prism Finder and Lens), and other parts. The System Management CPU in the camera body is located on the Main FPC and the Operation Control CPU is on the 4-layer PCB mounted at the side of the camera body.

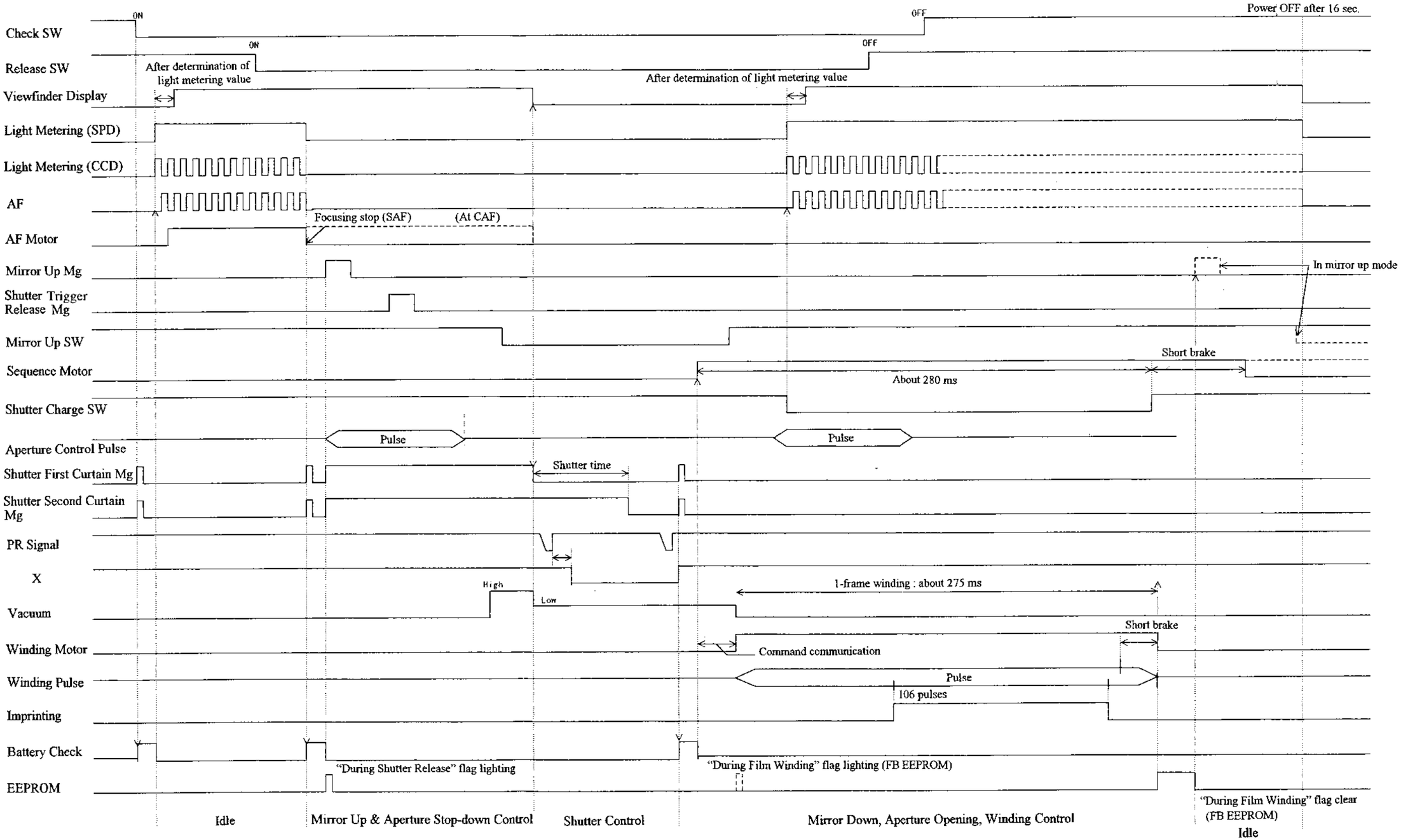
The System Management CPU controls read in of the settings of operation switches, controls the indications on the LCD panel in the camera body, commands operations required through communication with the Film Back, and manages power supply.

The Operation Control CPU controls the CCD area sensor, performs arithmetic operation for light metering and distance measuring and controls AF operation, carries out flash control including control of the TTL Flash Auto Control IC, and controls release sequence including arithmetic operation for exposure, and other basic camera operations. It also commands operations required by communication with the AE Prism Finder and the Lens, and manages backup data.

The functions of the CPUs in accessories are as follows : The Film Back CPU on the Film Back FPC controls film winding, exposure counter and data imprinting, reads in the ISO film speed setting, and controls Real Time Vacuum. The Finder CPU on the Finder FPC controls the operation of the Light Metering IC in the AE Prism Finder and indications on the LCD in the viewfinder, and communicates with the flash unit. The Lens CPU in the Lens reads in the aperture setting and carries out mechanical control, such as control of lens extension and aperture control.

In this way, the control functions are shared with different CPUs properly, thus the number of signal lines between the blocks is minimized to achieve a highly efficient wiring. In addition, as a result of such sharing of control functions, the CPUs have well-balanced processing capabilities to permit high-speed processing in total control of the camera. Moreover, the System Management CPU manages all the power supplies to prevent any unnecessary power consumption.

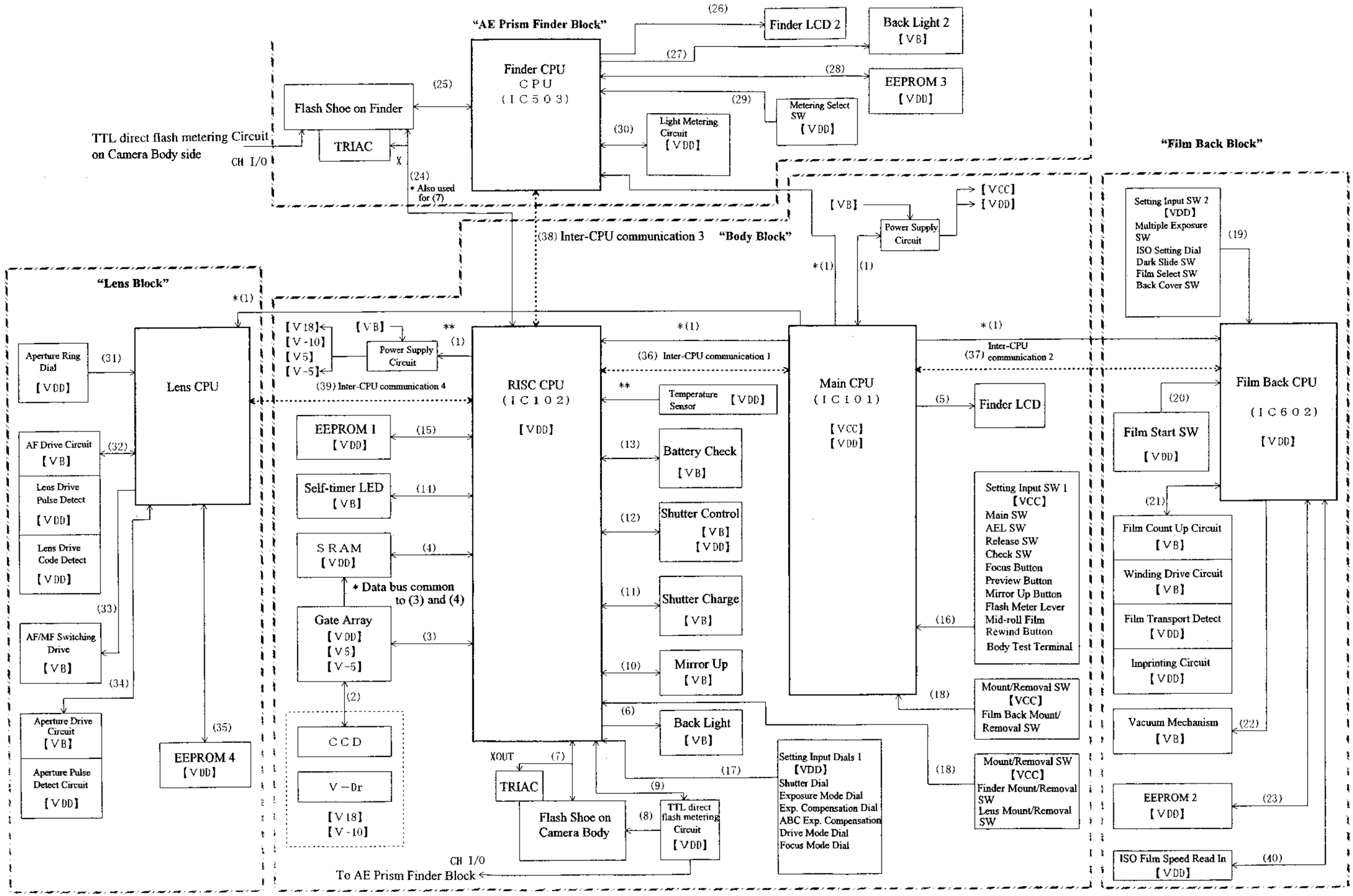
TIMING CHART



※ Under conditions of AF mode and S. drive mode (Irrespective of in-focus/out-of-focus, mirror up aperture stop-down control is started by turning the Release SW ON.)

ELECTRIC CIRCUIT BLOCK DIAGRAM

No.	419-01-41-RA1AU01



[Functions of Circuits in Electric Circuit Blocks and Explanation of Signal Lines]

* The number in ( ) represents the number shown in the Electric Circuit Block Diagram.

Power Supply System

** (1) Output Voltage

(Power Supply) (Application)
V 18 ---------- (+ 18 V) used on CCD P.C. Board
V-10 ---------- (– 10 V) used on CCD P.C. Board
V 5 ---------- (+ 5 V) used for CCD data amplifier
V-5 ---------- (– 5 V) used for CCD data amplifier
V DD ---------- (+ 5 V : for large current) stabilized power for camera control with DC/DC Converter turned ON
V CC ---------- (+ 3 ~ 5 V) power to the Main CPU with the DC/DC Converter turned OFF
V B ---------- (battery voltage 3 ~ 6 V) driving of actuators
GND
V 18, V-10, V 5 and V-5 are controlled by the RISC CPU.
V DD, V CC and the power to the Film Back CPU are controlled by the Main CPU.
The power to the Finder CPU and that to the Lens CPU are controlled by the RISC CPU.

1. Control by Main CPU (IC101)

(1) Control of Power Supplies
The Main CPU controls various power supplies.

Terminal Name	Pin	I/O	Description of Function
VDDON	20	O	Turning ON of the DC/DC IC control terminal for VDD output
RESET	68	I	Input from the RESET IC
RESRC	34	O	Control port for the signal to the RISC CPU reset terminal
FBVDD	19	O	Control of the base of the transistor for controlling the VDD supply line to the Film Back block
FBVB	35	O	Control of the base of the transistor for controlling the VB supply line to the Film Back block

(5) Control of Viewfinder LCD
Based on the processing of information input from outside and other information, the Main CPU controls the camera data indications on the LCD in the Viewfinder.
SEG (26 lines) × COM (3 lines) = 78 segments

S 12 (Pin 1) ~ S 25 (Pin 14) terminals
S 0 (Pin 69) ~ S 11 (Pin 80) terminals

(16) Read-in Control of Signals from Setting Input Switches 1
The Main CPU reads in the signals of the switches set from outside and carries out control accordingly.
This control includes the control associated with the power-ON operations.

Terminal Name	Pin	I/O	Description of Function
MAINSW	38	I	Main Switch input ON : "L"
AELSW	51	I	AE Lock Switch input ON : "L"
CHESW	60	I	Check Switch input ON : "L"
RELSW	61	I	Release Switch input ON : "L"
FOCSW	62	I	Focus Switch input ON : "L"
REVSW	63	I	Preview Switch input ON : "L"
MUP	66	I	Mirror Up Switch input ON : "L"
FLASH	43	I	Flash Meter Switch input ON : "L"
WINDSW	64	I	Mid-roll Film Rewind Switch input ON : "L"
TEST	65	I	Test input

(18) Read-in Control of Signal from Mount/Removal Switch

The Main CPU detects whether the removable Film Back block has been mounted on the camera body.

Terminal Name	Pin	I/O	Description of Function
FLMSET	52	I	Film Back mount/removal switch. Removed : "H"

(36) Main CPU — RISC CPU (Inter-CPU communication 1)

The Main CPU communicates with the RISC CPU to carries out system control according to power status.

Terminal Name	Pin	I/O	Description of Function
SCKRC	39	O	Serial clock for communication
SDIRC	41	I	Input of serial data for communication
SDORC	40	O	Output of serial data for communication
REQRC	37	O	Communication request signal
ACKRC	48	I	Communication ACK

(37) Main CPU — Film Back CPU (Inter-CPU communication 2)

The Main CPU communicates with the Film Back CPU to control film transport and imprinting.

Terminal Name	Pin	I/O	Description of Function
SCKFB	53	O	Serial clock for communication
SDIFB	47	I	Input of serial data for communication
SDOFB	50	O	Output of serial data for communication
REQFB	30	O	Communication request signal
ACKFB	49	I	Communication ACK

2. Control by RISC CPU (IC102)

** (1) Control of Power Supplies

The RISC CPU controls various power supplies.

Terminal Name	Pin	I/O	Description of Function
V18ON	105	O	Turning ON of the DC/DC IC control terminal for +18/–10 V
V50ON	104	O	Turning ON of the DC/DC IC control terminal for amplifier and Gate Array (+5 V/–5 V)
GTPON	101	O	Control of the 5 V power supply for Gate Array
FDVCONT	60	O	Control of the base of the transistor for controlling the VB/VDD supply line to the Finder block
LZVCONT	59	O	Control of the base of the transistor for controlling the VB/VDD supply line to the Lens block

(3) Control of Gate Array

The RISC CPU controls the Gate Array which carries out CCD control.

Terminal Name	Pin	I/O	Description of Function
DOUT 0 ~ 7	143 ~ 136	I	Data bus for outputs from Gate Array * 2 (Common bus)
IORD	94	O	External I/O lead terminal
SI	99	O	SRAM chip select S1
TBUSY	3	I	"Gate Array under exposure processing" signal
TSTART	134	O	Data output trigger signal
FTTRG	129	O	Exposure end signal (frame shift start trigger)
STTRG	128	O	Exposure start signal
REQGT	127	O	Communication request signal

Terminal Name	Pin	I/O	Description of Function
ACKGT	10	I	Communication recognition signal
SCKGT	45	O	Command communication reference clock
SDIGT	47	I	Command/data input
SDOGT	48	O	Command/data output
RESB	133	O	Register reset
CSPOT	132	O	Chip select signal of EEPOT of externally mounted circuit of Gate Array
U/D	131	O	Up/down signal of EEPOT of externally mounted circuit of Gate Array
INC	130	O	Increment signal of EEPOT of externally mounted circuit of Gate Array

(4) Control of SRAM (1 M bits) Block

The RISC CPU controls access to the memory where Gate Array data have been stored.

Terminal Name	Pin	I/O	Description of Function
DOUT 0 ~ 7	143 ~ 136	I	Data bus for outputs from Gate Array * 2 (Common bus)
ADR 0 ~ 16	125 ~ 118 116 ~ 108	O	Address bus to SRAM
WE	91	O	SRAM write enable signal
OE	89	O	SRAM output enable signal
CNTRES	102	O	Reset of Counter for SRAM address
GATEC	103	O	Line buffer control signal of SRAM address line
S 1	99	O	SRAM chip select S 1

* Control of Gate Array → SRAM (Data bus common to (3) and (4))

Terminal Name	Pin	I/O	Description of Function
HTCLM	25	O	Clock for address counter
S 2	26	O	SRAM chip select S 2
DOUT 0 ~ 7	143 ~ 136	I/O	Data bus for outputs from Gate Array * 2 (Common bus)

* (2) Gate Array CCD (IC303) Control Signal

The RISC CPU controls the CCD according to the Gate Array data and receives data from the CCD.
The I/O indicated here is as viewed from the Gate Array.

Terminal Name	Pin	I/O	Description of Function
NSUBC	61	O	NSUB drive pulse to CCD
DHTR	72	O	Output buffer reset gate pulse to CCD
VI 1 ~ 4	63 ~ 66	O	Vertical drive pulse for light receiver to V-Driver
VS 1 ~ 4	67 ~ 70	O	Vertical drive pulse for accumulator to V-Driver
DHT 1 ~ 2	74, 75	O	Horizontal transfer pulse to CCD
CCDIN	6	I	Terminal for data output from CCD

(6) Viewfinder Back Light

The RISC CPU controls the back light in the Viewfinder to ensure that the Viewfinder LCD can be seen at an appropriate brightness.

Terminal Name	Pin	I/O	Description of Function
FBLCD 1	19	O	Low-illuminance back light
FBLCD 2	18	O	High-illuminance back light

(7) TLA Flash Extension Cord Socket for Flash Mounted on Camera Body
The RISC CPU controls the firing of the flash mounted on the camera body via the TLA Flash Extension Cord.

Terminal Name	Pin	I/O	Description of Function
XOUT	38	O	Flash firing signal and TRIAC control signal, used also for (24) Flash Shoe on Finder
AX	51	O	Flash assist firing signal (second curtain synchronization) from CPU, used also for (24) Flash Shoe on Finder
CHI/O	-	I	Flash charge completion signal from flash unit, used also for flash firing stop signal in the TTL Flash Auto Control circuit, and also used for (24) Flash Shoe on Finder

(8) TTL Direct Flash Metering Circuit — TLA Flash Extension Cord Socket for Flash Mounted on Body
The RISC CPU, through the TTL direct flash metering circuit, controls firing stop of the flash mounted on the camera body.

Terminal Name	Pin	I/O	Description of Function
CHI/O	-	O	Flash firing stop signal, used also for Finder CHI/O, and also used for CHI/O of RISC CPU

(9) TTL Direct Flash Metering Circuit
The RISC CPU, through the TTL direct flash metering circuit, controls TTL direct flash metering operation (Flash Meter) and detects presence/absence of TTL direct flash metering.

Terminal Name	Pin	I/O	Description of Function
CHS	57	I	Flash firing stop signal ; INT terminal, used also for Finder CHI/O, and also used for CHI/O of camera body
CHC	58	O	TTL direct flash metering start signal
CSCH	61	O	Communication request signal
SDOCH	56	O	ISO data output line } Serial communication line
SCKCH	54	O	Transfer clock } Serial communication line
GC 1 ~ 5	8 ~ 4	O	Setting of FL output gain magnification
CAP 1 ~ 2	15, 16	O	Capacity control of FL integrating capacitor
CHOUT	29	I	FL level input
CPUCHS	90	O	CHI/O output signal from CPU

(10) Mirror Up Circuit
The RISC CPU, through the Mirror Up Circuit, controls mirror up and down.

Terminal Name	Pin	I/O	Description of Function
MMGON	78	O	Mirror Up Magnet turning ON signal
MUPSW	75	I	Mirror Up Switch

(11) Shutter Charge Circuit
The RISC CPU, through the Shutter Charge Circuit, controls the Sequence Motor for shutter charge.

Terminal Name	Pin	I/O	Description of Function
SQON	73	O	Sequence Motor turning ON signal
SQBR	72	O	Sequence Motor braking signal
SHSW	74	I	Shutter charge completion switch

(12) Shutter Control Circuit

The RISC CPU, through the Shutter Control Circuit, controls shutter operation at a proper shutter speed.

Terminal Name	Pin	I/O	Description of Function
SH1ON	77	O	First curtain shutter hold signal
SH2ON	76	O	Second curtain shutter hold signal
KINMG	79	O	Shutter trigger Release Magnet turning ON signal
SHPR	106	O	Photo-reflector LED lighting signal for shutter
XIN 1	1	I	Input of photo-reflector signal for shutter
XIN 2	2	I	Input of constant-speed drive signal of lens from Lens CPU

(13) Battery Check Circuit

The Battery Check Circuit, under control of the RISC CPU, performs battery check, by turning ON the load, to determine the battery voltage level.

Terminal Name	Pin	I/O	Description of Function
BATON	21	O	Battery load turning ON signal
BATIN	33	I	Battery level input signal

(14) Self-timer LED

The RISC CPU controls the LED which will blink during self-timer operation.

Terminal Name	Pin	I/O	Description of Function
SELED	20	O	Self-timer LED lighting control

(15) EEPROM 1

The RISC CPU stores camera status information and compensation data in memory in the camera body.

Terminal Name	Pin	I/O	Description of Function	
SCKEE	54	O	Serial clock for communication	Serial 3-line type
SDIEE	55	I	Data input	Used also for communication with
SDOEE	56	O	Data output	TTL Flash Auto Control Circuit
CSEE	53	O	EEPROM CS	

(17) Read-in Control of Signals from Setting Input Dials 1

The RISC CPU reads in the signals of the dials set from outside and carries out control accordingly.

Terminal Name	Pin	I/O	Description of Function
SHDAL	30	O	Shutter Speed Dial. Detects shutter speed by A/D input terminal.
MOSDAL	31	O	Exposure Mode Dial. Detects exposure mode by A/D input terminal.
HOSDAL	32	O	Exposure Compensation Dial. Detects exposure compensation value by A/D input terminal.
ABC 1 ~ 2	97, 98	O	A.B.C. exposure compensation. Detects A.B.C. exposure compensation value by 2-bit code input terminal.
DRIV 1 ~ 2	95, 96	O	Drive Mode Dial. Detects drive mode by 2-bit code input terminal.
FOCS 1 ~ 2	92, 93	O	Focus Mode Dial. Detects focus mode by 2-bit code input terminal.

(24) Flash Shoe on AE Prism Finder

The RISC CPU controls the firing of the flash mounted on the AE Prism Finder.

Terminal Name	Pin	I/O	Description of Function
XOUT	38	O	Flash firing signal and Triac control signal, used also for (7) TLA Flash Extension Cord Socket for Flash Mounted on Camera Body
AX	51	O	Flash assist firing signal (second curtain synchronization) from CPU, used also for (7) TLA Flash Extension Cord Socket for Flash Mounted on Camera Body

(36) Communication between Main CPU — RISC CPU (Inter-CPU communication 1)
The Main CPU and the RISC CPU communicate with each other to carries out system control, such as power status control.

Terminal Name	Pin	I/O	Description of Function
SCKRC	44	I	Serial clock for communication
SDIRC	42	O	Output of serial data for communication
SDORC	43	I	Input of serial data for communication
REQRC	49	I	Communication request signal
ACKRC	11	O	Communication ACK

(38) Communication between RISC CPU — Finder CPU (Inter-CPU communication 3)
The RISC CPU communicates with the Finder CPU to carry out light metering control, Finder - Flash communication and viewfinder display.

Terminal Name	Pin	I/O	Description of Function
SCKFD	25	O	Serial clock for communication
SDIFD	24	I	Input of serial data for communication
SDOFD	23	O	Output of serial data for communication
REQFD	22	O	Communication request signal
ACKFD	13	I	Communication ACK

(39) Communication between RISC CPU — Lens CPU (Inter-CPU communication 4)
The RISC CPU communicates with the Lens CPU to carry out AF drive and aperture drive control.

Terminal Name	Pin	I/O	Description of Function
SDILZ	40	I	Input of serial data for communication
SDOLZ	39	O	Output of serial data for communication
REQLZ	52	O	Communication request signal
ACKLZ	12	I	Communication ACK

*** Temperature Sensor Input
The RISC CPU measures the temperature at camera operation by detecting the voltage of the temperature sensor output.

Terminal Name	Pin	I/O	Description of Function
TEMP	28	I	Detects the voltage of temperature sensor output. A/D input

(18) Read-in Control of Signal from Mount/Removal Switch
The RISC CPU detects the state of the Mount/Removal Switches for Finder and Lens.

Terminal Name	Pin	I/O	Description of Function
FNDSET	14	I	Finder Mount/Removal Switch
LZSW	41	I	Lens Mount/Removal Switch

3. Control by Film Back CPU (IC602)

(19) Setting Input Switches 2

The Film Back CPU detects the states of the switches and dials set on the Film Back and controls operations.

Terminal Name	Pin	I/O	Description of Function
MESW	30	I	Multiple Exposure Switch. Winding after shutter operation does not take place when the Multiple Exposure Lever is in the ON position.
ISO 0 – 4	1 – 4	I	ISO Setting Dial. ISO12 ~ ISO6400
DXPOS	5	I	ISO Setting Dial. DX position
HIKISW	29	I	Dark Slide Switch. This switch is coupled with the Dark Slide located between the Film Back and the camera body.
FLM 120	12	I	Film Select Switch. This switch is coupled with the rotation of the pressure plate of the Film Insert (120/220).
URASW	10	I	Back Cover Switch. This switch detects opening/closing of the Back Cover of Film Back.

(20) Film Start Switch

With the switch coupled with the mechanical exposure counter, the Film Back CPU detects the state where blank shots advance has been completed or not.

Terminal Name	Pin	I/O	Description of Function
FLMST	6	I	Film Start Switch. The switch coupled is switched just when the film position changes as S→1.

(21) Winding Drive Circuit / Film Transport Detection / Imprinting Circuit

The Film Back CPU carries out imprinting control while controlling film winding.

Terminal Name	Pin	I/O	Description of Function
MKMOT 1	16	O	
MKMOT 2	18	O	
MKPCNT	14	O	Control of Winding Photo-coupler LED
MKPCIN	31	I	Input of the signal from the Winding Photo-coupler
LEDB 1 – 7	21, 22 24 ~ 28	O	Control terminals of a set of 7 dot imprinting LEDs
FUPON	32	O	Control terminal of exposure count up plunger

	Forward Run	Brake	Free
MKMOT 1	1	1	0
MKMOT 2	0	1	0

(22) Vacuum Function

The Film Back CPU controls the vacuum function to suction the film to the pressure plate to ensure a high flatness during film exposure.

Terminal Name	Pin	I/O	Description of Function
VCON	19	O	
VCSTART	20	O	

	Large Current Control	Steady State Control	Free
VCON	1	0	1
VCSTART	0	1	1

(23) EEPROM 2 (IC601)

The Film Back CPU stores exposure counter, camera status information and compensation data in memory in the Film Back.

Terminal Name	Pin	I/O	Description of Function
FLCKEE	7	O	Serial clock for communication
FLDIEE	9	I	Data input
FLDOEE	8	O	Data output
FLCSEE	13	O	EEPROM CS

(23) Communication between Film Back CPU — Main CPU (Inter-CPU communication 2)
The Film Back CPU communicates with the Main CPU.

Terminal Name	Pin	I/O	Description of Function
SCKFB	7	I	Serial clock for communication (FLCKEE)
SDOFB	9	I	Data input (FLDIEE)
SDIFB	8	O	Dat output (FLDOEE)
REQFB	33	I	Communication request signal from Main CPU (INT terminal)
ACKFB	11	O	Communication ACK to Main CPU

(40) ISO Film Speed Read-in Circuit
The Film Back CPU reads the bar code on the film (Fuji Film) into the photo-reflector and sets the ISO film speed automatically.

Terminal Name	Pin	I/O	Description of Function
PRCNT	15	O	Photo-reflector control
PRIN	43	I	Input of photo-reflector signal. A/D Input

4. Control by Finder CPU (IC503)

(25) Flash Shoe on AE Prism Finder
The Finder CPU controls the firing of the flash mounted on the AE Prism Finder.

Terminal Name	Pin	I/O	Description of Function
SDAST 1	50	I/O	Data transmission and receiving line dedicated for communication flash
SDKST 1	56	I	Communication clock for communication flash data

(26) Viewfinder LCD 2
The Finder CPU carries out indication control of camera data on the LCD in the viewfinder.
SEG (26 lines) × COM (3 lines) = 78 segments

COM 0 (Pin 7) – COM 2 (Pin 9) terminals
SEG 0 (Pin 11) ~ SEG 25 (Pin 36) terminals

(27) Back Light 2
The Finder CPU controls the back light in the Viewfinder to ensure that the Viewfinder LCD can be seen at an appropriate brightness.

Terminal Name	Pin	I/O	Description of Function
FFLCD 1	38	O	Low-illuminance back light
FFLCD 2	37	O	High-illuminance back light

(28) EEPROM 3 (IC501)
The Finder CPU stores light metering compensation data in memory in the Finder.

Terminal Name	Pin	I/O	Description of Function
FSCKEE	64	O	Serial clock for communication
FSDIEE	62	I	Data input
FSDOEE	63	O	Data output
FCSEE	61	O	EEPROM CS

(29) Metering Select Switch

The Finder CPU, through the Metering Select Switch, detects the switching of light metering mode between SPOT and AVE set from outside.

Terminal Name	Pin	I/O	Description of Function
SPOTSW	52	I	SPOT : "H", AVE : "L"

(29) Light Metering Circuit

The Finder CPU, through the Light Metering Circuit, controls light metering of the camera and obtains light metering data. (Light Metering IC 504)

Terminal Name	Pin	I/O	Description of Function
SEL 0	60	O	
SEL 1	59	O	
AEVREF	40	I	VREF output from AE IC. Input to CPU VREF.
AEIN	41	I	Data input terminal of AE IC. A/D port.

	AVE	SPOT
SEL 0	1	1
SEL 1	1	O

(38) Communication between Finder CPU — RISC CPU (Inter-CPU communication 3)

The Finder CPU communicates with the RISC CPU.

Terminal Name	Pin	I/O	Description of Function
SCKFD	75	I	Serial clock for communication
SDIFD	76	O	Output of serial data
SDOFD	77	I	Input of serial data
ACKFD	78	O	Communication ACK signal
REQFD	51	I	Communication request signal

5. Control by Lens CPU

(31) Aperture Ring Dial

The Lens CPU reads in the aperture code set from outside.

F 2.0 ~ F 22 1/6 EV steps

(32) AF Drive Circuit / Lens Drive Pulse Detection / Lens Drive Detection

The Lens CPU carries out AF drive control while detecting Lens position.

(33) AF/MF Switching Drive

The Lens CPU carries out solenoid control for switching between AF and MF by an external switch.

(34) Aperture Drive Circuit / Aperture Pulse Detect Circuit

The Lens CPU carries out aperture drive control with the Stepping Motor.

(35) EEPROM 4

The Lens CPU stores lens information and compensation data in memory in the Lens.

(39) Communication between Lens CPU — RISC CPU (Inter-CPU communication 4)

The Lens CPU communicates with the RISC CPU.

FUNCTIONS OF SWITCHES

〈External Operation Switches of Camera Body〉

(1) Main Switch

This switch turns ON/OFF the power to the camera and switches AE Lock.

OFF	Main Switch OFF
↓ ↑	
ON	Main Switch ON
↓ ↑	
AEL	AE lock (Main Switch is ON)

(2) Check Switch

When the Shutter Release Button is depressed halfway with the Main Switch turned ON, the Check Switch turns OFF → ON ("H"→"L") so that the circuit power is turned ON, the camera starts light metering and distance measuring, and the viewfinder LCD starts indication. Then the camera will hold the power (for 16 seconds).

(3) Release Switch

When the Shutter Release Button is depressed all the way, the Release Switch turns OFF → ON ("H"→"L") so that the shutter starts operating and at the same time, the viewfinder LCD goes out.

(4) Shutter Speed Dial

This Shutter Speed Dial sets a shutter speed. 1/4000 to 8 seconds (16 steps).

The position of the Shutter Speed Dial is input to the CPU in the form of voltage. The CPU determines the setting position by A/D conversion of the voltage value. The determined setting position is converted to a code, which is stored in RAM.

(5) Exposure Mode Dial

While pressing the Exposure Mode Lock Release Button, turn the Exposure Mode Lever to set an exposure mode "Av", "Tv", "M", "X" or "B".

The position of the Exposure Mode Dial is input to the CPU in the form of voltage. The CPU determines the setting position by A/D conversion of the voltage value. The determined setting position is converted to a code, which is stored in RAM.

(6) Exposure Compensation Dial

This dial sets an exposure compensation value. – 2 to + 2 EV (in increments of 1/3 EV) (13 steps)

The position of the Exposure Compensation Dial is input to the CPU in the form of voltage. The CPU determines the setting position by A/D conversion of the voltage value. The determined setting position is converted to a code, which is stored in RAM.

(7) A.B.C. Exposure Compensation Dial

This dial selects a bracketing range for 3-frame continuous exposure control.

0	A.B.C. setting OFF
↓ ↑	
0.5	Setting of A.B.C. operation of ± 0.5 EV
↓ ↑	
1	Setting of A.B.C. operation of ± 1.0 EV

By a level detection method, the dial reads in the setting value from the state of the input port.

(8) Drive Mode Dial

This dial sets a drive mode of single frame shooting "S", continuous shooting "C" or self-timer "$\mathcal{O}_2$", "$\mathcal{O}_{10}$".

By a level detection method, the dial reads in the setting value from the state of the input port and converts it to a drive mode code.

(9) Focus Mode Dial

This dial sets a focus mode of manual focus "M", single focus "S", or continuous auto focus mode "C".

By a level detection method, the dial reads in the setting value from the state of the input port and converts it to a focus mode code.

(10) Focus Switch

When the Focus Lock Button is pressed in the auto focus mode, the Focus Button Switch turns OFF → ON ("H"→"L") and the focus is locked to the aimed subject (Focus Lock).

When the Focus Lock Button is pressed in the MF mode, Single AF operation takes place.

(11) Pre-view Switch

When the Aperture Stop-down Button is pressed in the "Av" mode, the Pre-view Switch turns OFF → ON ("H"→"L") and the lens is stopped down to the preset aperture value. When the Pre-view Button is released, the Pre-view Switch turns ON → OFF and the aperture returns to full open value. Also this switch controls the viewfinder display during preview.

Turning ON/OFF of the Pre-view Switch is detected by the Main CPU. On receiving this signal from the Main CPU, the RISC CPU sends to the Lens CPU the command to stop down the lens together with the information on the aperture step to be attained or the command to open the aperture fully. Aperture drive is controlled by the Lens CPU.

- Exposure is locked (AE Lock) while the Pre-view Switch is ON.
- When exposure mode is "Tv", aperture stop-down operation is impossible.

(12) Mirror Up Button Switch

When the Mirror Up Button is pressed, the Mirror Up Button Switch turns OFF → ON ("H" → "L") and the Mirror moves to the up position. When the Mirror Up Button Switch is turned ON again, the Mirror moves down.

- At pressing the Mirror Up Button, AF Lock and AE Lock take place.
- Mirror up is impossible when no lens has been mounted.

(13) Flashmeter Switch

When the Pre-Flash Lever is set to the ON position, the Flashmeter Switch turns OFF → ON ("H" → "L") and the camera automatically stop down the aperture, move the Mirror up and fire the flash (but does not trip the shutter).

An error relative to the correct value is displayed in the range of ± 2 EV on the Flashmeter and simultaneously the amount of flash (adjusted flash duration) is stored in memory.

- The adjusted flash duration (amount of flash) will be kept in memory until the Pre-Flash Lever is returned to the original position.

(14) Rewind Switch

Pressing the Mid-roll Film Rewind Switch with the Main Switch turned ON will turn ON the Rewind Switch to rewind the film up to the end.

〈Internal Mechanical Switches of Camera Body〉

(15) Film Back Mount/Removal Switch

This mechanical switch, coupled with attaching and removing of the Film Back, detects the state where the Film Back has been attached or removed.

When the Film Back has been removed : "H"

When the Film Back has been attached : "L"

(16) Finder Mount/Removal Switch

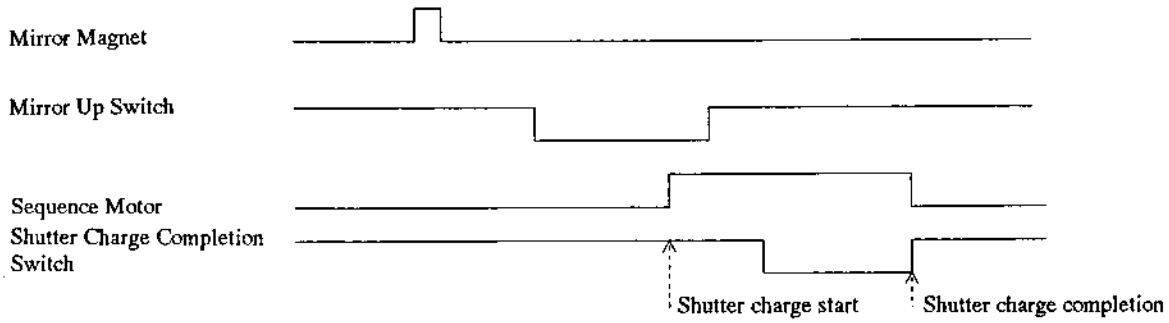
This mechanical switch, coupled with attaching and removing of the Finder, detects the state where the Finder has been attached or removed.
When the Finder has been removed : "H"
When the Finder has been attached : "L"

(17) Lens Mount/Removal Switch

This mechanical switch, coupled with attaching and removing of the Finder, detects the state where the Finder has been attached or removed.
When the Lens has been removed : "H"
When the Lens has been attached : "L"

(18) Shutter Charge Completion Switch

This switch, associated with the control of the Sequence Motor, detects the completion of shutter charge.
"L" → "H" : Shutter charge has been completed.



(19) Mirror Up Switch

This switch detects the control of mirror up/down.
Mirror down : "H" → Mirror up : "L"

(20) T Position Power ON Switch

This switch detects mechanical Bulb.
ON : mechanical Bulb

〈External Operation Switches of Film Back〉

(21) Multiple Exposure Switch

This switch inhibits film winding when the Multiple Exposure Lever located at the side of the Film Back has been set in the ON position.
When the Multiple Exposure Lever is in the ON position, the camera does not perform film winding.
Multiple exposure ON : "L"
Multiple exposure OFF : "H"

(22) Film ISO Dial

This dial sets a film speed. ISO 6 to 6400 (1/3 steps)
When bar coded system film is used, set the Film ISO Dial to "—" mark, and the ISO bar code will be read during blank shots advance and the film speed will be automatically set in the camera.
To the camera body, usually the ISO data read in from the terminal is transferred. However, when the Film ISO Dial has been set at "—" mark, the Film Back CPU reads in the ISO data from EEPROM and then transfers the data to the Main CPU.
When the dark slide is absent: "H" (ON)
The film speed is automatically set to ISO 100 when film other than bar coded system film is loaded.

〈Internal Mechanical Switches of Film Back〉

(23) Dark Slide Switch

This switch turns ON and OFF according to the presence and absence of the dark slide between the Film Back and the Camera Body.

The Film Back CPU, upon detection of the presence or absence of the dark slide, transmits the change in the Dark Slide Switch to the Main CPU.

When the dark slide is present : "L" (OFF)

When the dark slide is absent : "H" (ON)

(24) Film Select Switch

This switch selects 120 or 220 by rotating the pressure plate in the Film Insert inside the Back Cover.

The signal from this switch is used to determine whether vacuum control by the Finder CPU is to be performed or not.

The information on the 120/220 select switch is used only by the Film Back CPU, that is, it is not sent to the Camera Body.

When 120 is selected : "H"

When 220 is selected : "L"

(25) Back Cover Switch

This switch detects the opening/closing of the Back Cover of the Film Back.

When Back Cover is closed : "H"

When Back Cover is open : "L"

(26) Film Start Switch

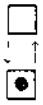
This switch, coupled with the mechanical exposure counter, detects the state where the exposure counter is positioned at the start point or not.

When the exposure counter turns S → •, the switch coupled turns "L" → "H".

〈External Operation Switches of AE Finder〉

(27) Metering Select Switch

This switch selects light metering system.



Center-weighted average light metering

Spot light metering

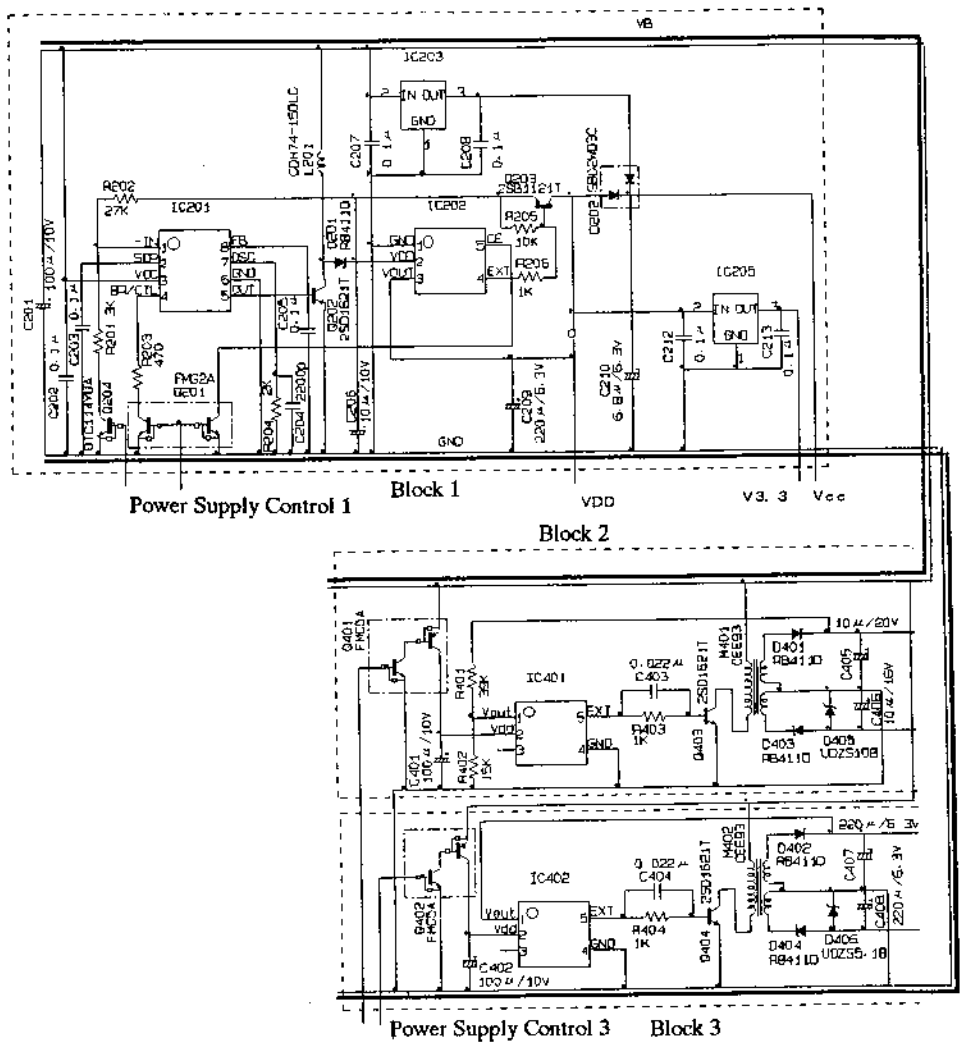
DESCRIPTION OF ELECTRIC CIRCUITS

〈Major Circuits in Camera Body〉

1. Power Supply Circuit

(1) Circuit Constitution

The Power Supply Circuit consists of three blocks as shown below.
The block 1, a circuit to supply VDD, VCC and V3.3, comprises IC201, IC202, IC203, L201, IC205, Q201, Q202, Q203, Q204, D201, D202 and resistors and capacitors.
The block 2, for supplying V+18 and V–10, consists of IC401, Q401, Q403, M401, D401, D403, D405, and resistors and capacitors.
The block 3, a circuit to supply V+5 and V–5, is composed of IC402, Q402, Q404, M402, D402, D404, D406, and resistors and capacitors.



(2) Description of Functions

[Block 1]

IC201, a PWM-type DC/DC Converter IC for voltage boosting, controls Q202 so that switching of the current flowing in L201 will be performed to execute voltage boosting. The current at the boosted voltage is fed back through R201 and R202 to IC201 to maintain its output. During low-power operation, however, to eliminate a waste of current in this feedback circuit, Q204 shuts off the current flowing in the feedback circuit.
IC202, a boost-type Regulator IC, controls Q203 to lower the voltage, if 5 V or above, output from the voltage boosting block controlled by IC201.

Usually, Q201 controls IC201 and IC202 to supply power. At low-power operation, however, Q201 is turned OFF so that these power supply circuits are stopped and power to the VDD line is shut off. Instead, only the power to the VCC line is supplied through IC203 to perform low-power operation.
IC205 is a Regulator IC which supplies, through the VDD line, the power (3.3 V) for controlling the RISC CPU.

[Block 2]

IC401, a PWM-type DC/DC Converter IC for voltage boosting, controls Q403 so that switching of the current flowing in M401 will be performed to execute voltage boosting. This boosted voltage is fed back through R401 and R402 to IC401 to maintain an output at + 18 V. At the same time, another output is maintained at – 10 V by the effect of balance between the M401 turn ratio and the load.
Q401 controls IC401 so that this block, when power supply from this block is not needed, will be stopped to reduce unnecessary power consumption.

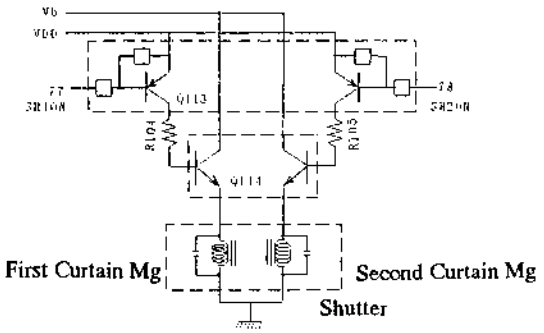
[Block 3]

Block 3 is constructed almost the same way as Block 2. However, when the output voltage after voltage boosting is + 5 V, the voltage in feedback to IC402 does not need to be divided. Therefore, this block supplies ± 5 V without incorporating any resistor in the feedback line.

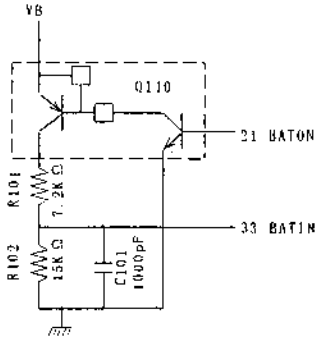
2. Battery Check Circuit

(1) Circuit Constitution

(Load Circuit)



(Detecting Circuit)

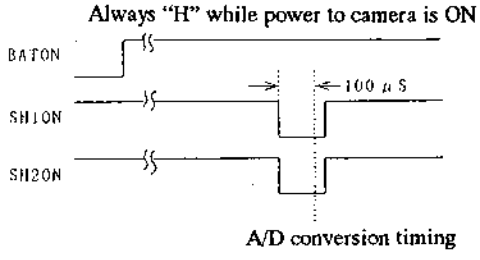


(2) Description of Functions

① The Load Circuit is also the Shutter Control Circuit, since the Shutter Magnets are used as the load.
② When SH1ON (Pin 77 of IC102) and SH2ON (Pin 76 of IC102) signals are turned "L", the First Curtain Magnet and Second Curtain Magnet are energized, working as an electrical load.
③ When BATON (Pin 21 of IC102) of the Detecting Circuit is turned "H", current flows in the Detecting Circuit and the voltage divided by R101 and R102 is A/D converted at BATIN (Pin 33 of IC102) terminal.
④ The result of A/D conversion is judged by the RISC CPU and the Battery Warning Mark is lighted in the viewfinder, as required.

(3) Battery Check Timing

① BATON (Pin 21 of IC102) is always "H" while the power to the camera is ON. (Detecting Circuit is always ON.)
② At battery check, SH1ON (Pin 77 of IC102) and SH2ON (Pin 76 of IC102) are turned "L" simultaneously.
③ 100 μsec later, the RISC CPU A/D converts the signal at BATIN (Pin 33 of IC102) terminal.
④ After A/D conversion, SH1ON (Pin 77 of IC102) and SH2ON (Pin 76 of IC102) are returned to "H".



A/D conversion timing

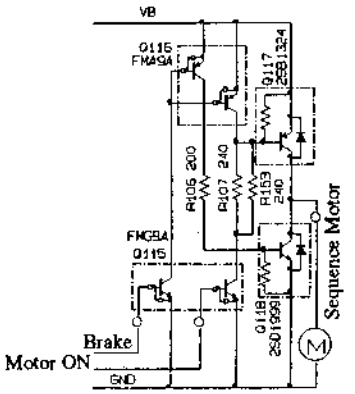
3. Shutter Charge Motor Circuit

(1) Circuit Constitution

This circuit consists of Q115, Q116, Q117, Q118, R106, R107 and R153.

(2) Description of Functions

Q115 is controlled by the RISC CPU so that Q117 is turned ON to run the motor or Q118 is turned ON to brake the motor.
If Q117 and Q118 are turned ON at the same time, the circuit would be destroyed. The circuit incorporates Q115 to ensure that Q117 and Q118 never turn ON simultaneously even if any incorrect control signal has been input to Q116 for some reason.



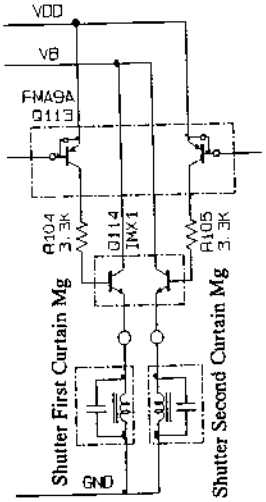
4. Shutter Drive Circuit

(1) Circuit Constitution

This circuit consists of Q113, Q114, R104 and R105.

(2) Description of Functions

Q113 is controlled by the RISC CPU so that Q114 controls power supply to the Shutter Magnets.
VDD supplies power to Q113 and the resistors R104 and R105 keep the base voltage of Q114 reasonably constant to stabilize the magnet drive voltage.



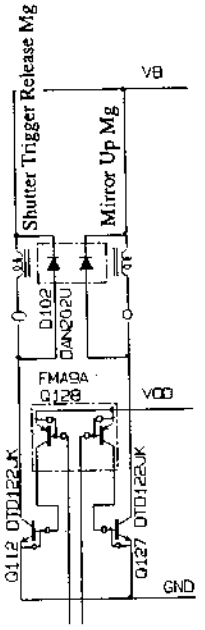
5. Mirror Up Magnet / Shutter Trigger Release Magnet Drive Circuit

(1) Circuit Constitution

This circuit consists of Q112, Q127, Q128 and D102.

(2) Description of Functions

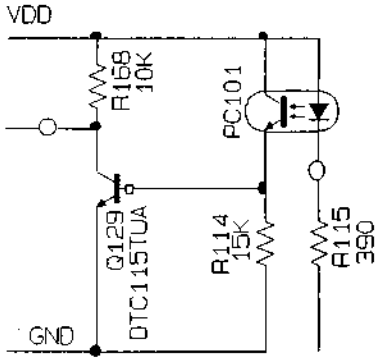
The Mirror Up Magnet and the Shutter Trigger Release Magnet are exactly of the same specifications and the two circuits are constructed exactly the same way.
Q128 is controlled by the RISC CPU so that switching between Q112 and Q127 is performed to make current from VDD flow in the magnet. D102 is incorporated to absorb the counter current from the magnets when Q112 and Q127 are turned OFF.



6. Unexposure Detect Circuit

(1) Circuit Constitution

This circuit consists of PC101, Q129, R114, R115 and R168.



(2) Description of Functions

PC101, a reflection type photo-reflector, detects the travel of shutter curtains.

During travel of shutter curtains, the LED of the Photo-reflector is lighted via R115 and a change in the output from the Photo-reflector, after its level change by Q129, is input to the RISC CPU as a signal.

7. TTL Direct Flash Metering

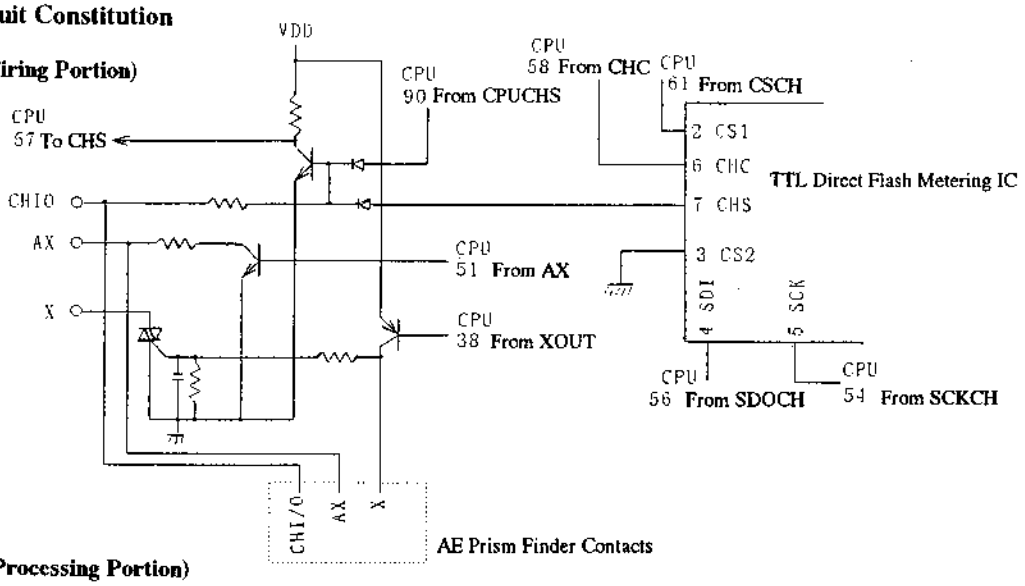
TTL direct flash metering and Pre-flash use the same and sole circuit.

For TTL direct flash metering, the circuit is operated in the release sequence and TTL direct flash metering is performed using flash light reflected by the film plane.

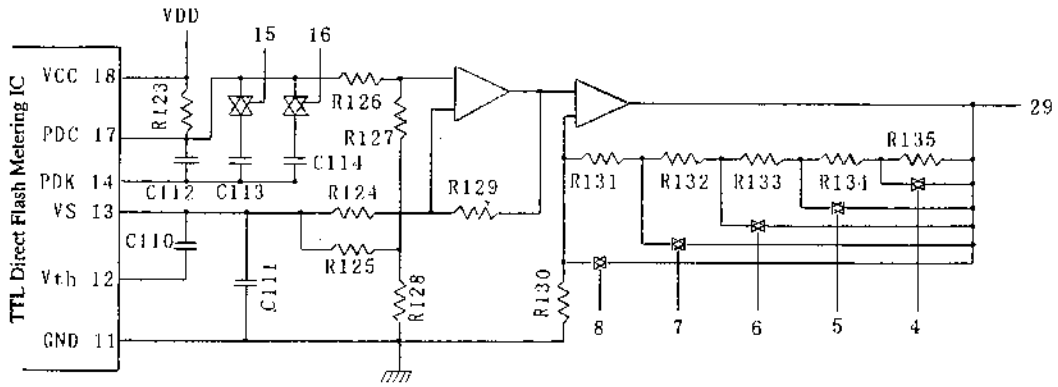
For pre-flash, the circuit is operated when the Pre-Flash Lever is set in the ON position, and the light reflected by the shutter first curtain is metered.

(1) Circuit Constitution

(Flash Firing Portion)



(Signal Processing Portion)

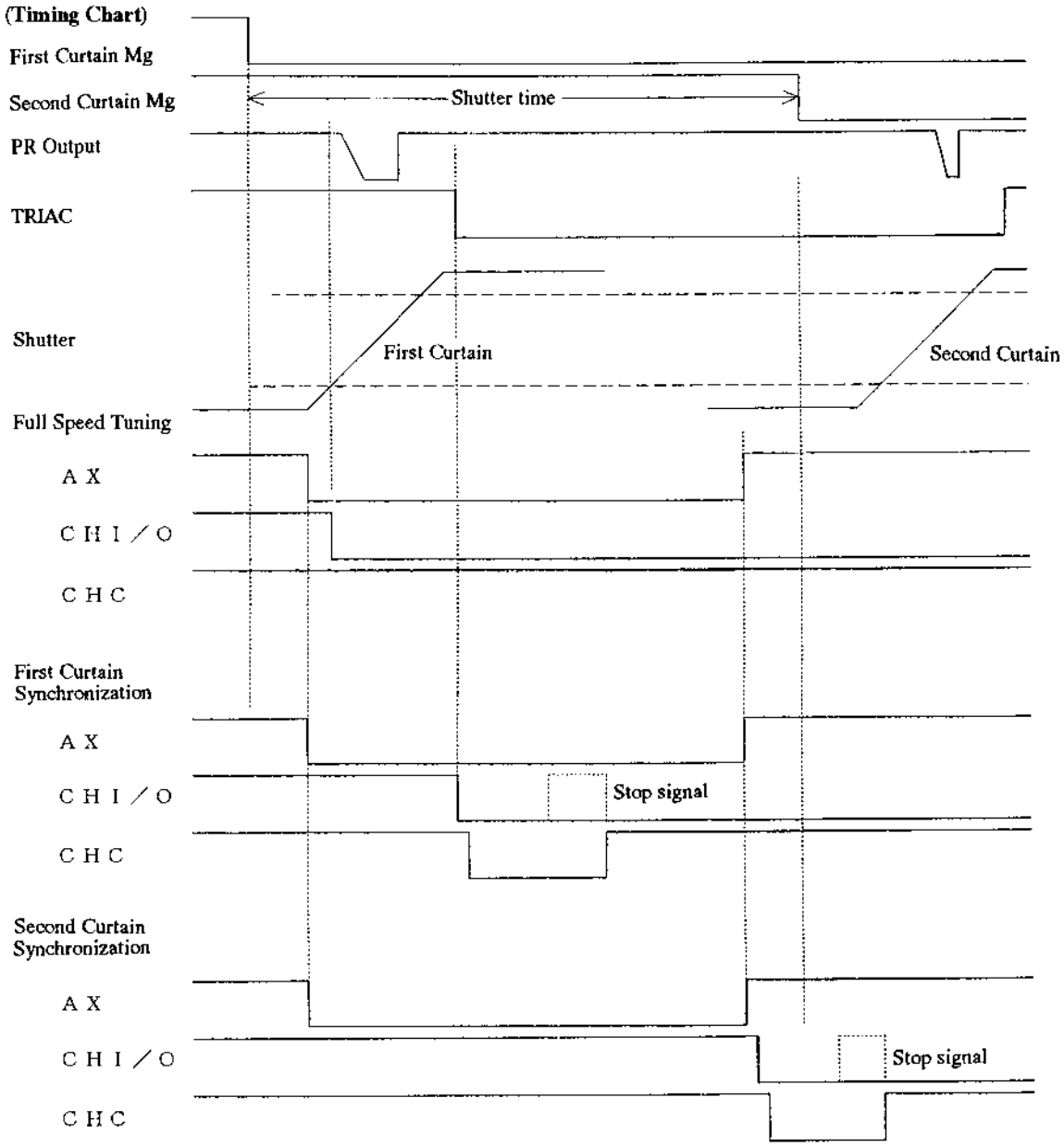


* The numbers in the diagram represent the corresponding terminal numbers of the RISC CPU.

(2) Description of Functions

(2) - 1 TTL Direct Flash Metering

When the flash charge completion signal from the CHIO terminal is input to the RISC CPU, the RISC CPU judges that the camera is in the flash control mode. TTL direct flash metering control is not performed if the flash charge completion signal has not been input.



TTL direct flash metering is performed in parallel with shutter control. Control is carried out at the timing as shown above for full speed tuning, first curtain synchronization and second curtain synchronization.

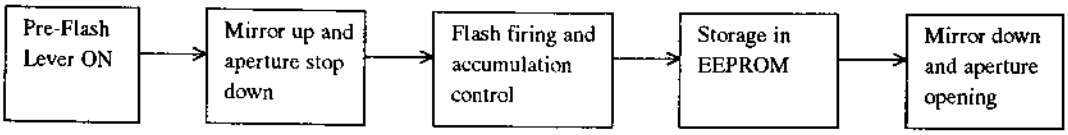
However, TTL direct flash metering control is not performed with full speed tuning (because such control is not necessary).

This circuit checks whether CHIO signal rises at each timing for flash firing, and if it rises, judges that flash firing takes place, and starts TTL direct flash metering control.

The TTL Direct Flash Metering IC integrates the light received by the SPD, compares it with the reference voltage corresponding to the ISO value and when the integrated value has reached the appropriate level, outputs the firing stop signal to the flash. The integration time becomes the shutter time but limited to a maximum of 5 msec.

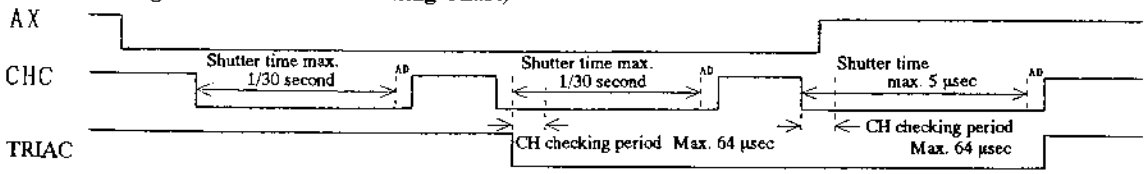
(2) - 2. Pre-flash

Pre-flash takes place when the Pre-Flash Lever is set to ON. To meter the light reflected by the center of the shutter first curtain, aperture is stopped down to the actual value and the Mirror is moved up, and then metering control of the flash light is performed. After completion of light metering, the Mirror is moved down and aperture is opened.


Pre-Flash Lever ON
Mirror up and aperture stop down
Flash firing and accumulation control
Storage in EEPROM
Mirror down and aperture opening

① When the Pre-Flash Lever is set to ON, the AVCONT (the number of aperture stop-down steps) signal is sent to the Lens and aperture stop-down is started.
② Mirror up operation is started.
③ On completion of aperture stop-down and mirror up, the gain appropriate to the ISO value is set, flash firing and accumulation control are carried out, and light metering data is acquired.
④ The light metering data and adjusted flash duration, and the aperture code, exposure compensation code and ISO code at pre-flash are stored in EEPROM.
⑤ The aperture opening signal is communicated to the Lens and aperture opening is started.
⑥ Mirror down operation is started.
⑦ On completion of aperture opening and mirror down, the sequence ends.

(Flash Firing and Accumulation Timing Chart)



Light metering control is carried out at the timing as shown above. Since the camera can not know the flash firing mode, this circuit carries out flash firing control at three timings, namely, for full speed, first curtain and second curtain, performs integration at each timing and acquires data.
With a TLA flash unit, this circuit detects the fall of the CHIO signal and collects the data when the CHIO signal changes.
With a general flash unit which does not generate any flash charge completion signal, this performs the operation of integration only at the first curtain as shown in the middle of the illustration above.

(2) - 3. Flash Firing Control

Flash firing is performed by the AX signal and X signal. To generate the X signal, no mechanical switch in the shutter is used, but the TRIAC is used.
In the release sequence, the TRIAC is turned ON at the timing based on the signal from the photo-reflector which is monitoring the shutter first curtain.
For pre-flash, the TRIAC is turned ON at the timing as shown above.

X (Synchro contact) : Starts flash firing on receiving the ON signal from the camera body.
CH I/O : Informs the camera body of flash charge state.
Flash not charged : "L"
Flash fully charged : "H"
After flash firing : "L"
Power switch OFF : "L"
: Receives the flash firing stop signal.
After start of flash firing, this terminal sets the mode "L" to wait for the flash firing stop signal from the camera body. On receiving the signal "L" → "H" from the camera body, this terminal stops flash firing.
AX : Informs the flash unit of the timing for flash firing start for full speed tuning and second curtain synchronization.
"H" → "L" : Flash firing start in full speed tuning
"L" → "H" : Flash firing start in second curtain synchronization

(2) - 4. Control of TTL Direct Flash Metering IC

① Through Pin 4 and Pin 5 of the TTL Direct Flash Metering IC, the CPU transfers a code corresponding to the ISO value by serial communication. According to this code, the reference voltage Vth is determined.
② When the CHC signal (Pin 7 of TTL Direct Flash Metering IC) is turned "L", integration is started. Vth rises at this point.
③ The light directed to the SPD is integrated by the integrating capacitor connected between PDK (Pin 14) and PDC (Pin 17), and thus is taken out as a voltage.
④ The integrated voltage is input to the comparator inside the IC and compared with Vth.
⑤ When the integrated voltage exceeds Vth, the stop signal CHS is output and the flash stops firing.

(2) - 5. Description of External Circuit

① The External Circuit is shown at "Signal Processing Portion" on page A-35.
② The integrating capacitors located between PDK and PDC of the TTL Direct Flash Metering IC are switched by an analog switch for TTL direct flash metering or pre-flash.

	Capacitor(s)	CAP1 (Pin 15 of CPU)	CAP2 (Pin 16 of CPU)
TTL direct flash metering operation	C112 + C113	ON	OFF
Pre-flash normal	C112	OFF	OFF
Pre-flash large signal	C112 + C113 + C114	ON	ON

③ During TTL direct flash metering operation, the amplifiers located behind the integrating capacitor are not used. At pre-flash, the voltage at the PDC terminal is supplied through an amplifier and finally A/D converted by an amplifier to provide an integrated value.
④ The PDC voltage, which is to be output with VS (about 1.2 V) as the reference, is generated as the difference from VS signal by subtracting the VS component by the first stage amplifier.
⑤ The signal obtained by removing the VS component is input to the post-stage amplifier.
⑥ The final output is taken in as the data by the A/D Converter of the RISC CPU.

(2) - 6. Connection to AE Prism Finder

For connection to the AE Prism Finder, the AX and CH IO signals in parallel with those at the flash contacts of the camera body are connected through the mounting contacts of the AE Prism Finder to the hot shoe.
For X signal, the output from the transistor on the pre-stage of the TRIAC is transferred through the AE Prism Finder contacts to the inside of the Finder and connected to the TRIAC inside the AE Prism Finder.

8. SRAM Control Circuit

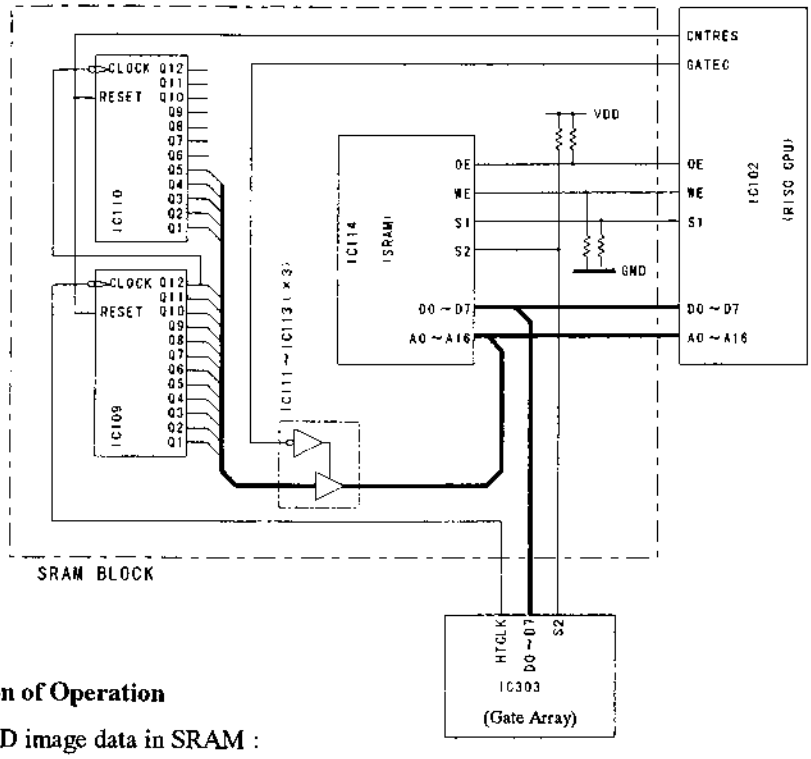
(1) Outline

The image data accumulated by the CCD is converted to digital data by the Gate Array (IC303) and stored in SRAM (IC114). The RISC CPU (IC102) reads in the image data from SRAM and performs arithmetic operation for AF, etc.

(2) Circuit Constitution

IC303 : Gate Array for CCD control.
IC109 and IC110 : 12-step binary counter which generates the address in SRAM where data is to be written.
IC111 ~ IC113 : Buffer which turns ON/OFF the connection between SRAM and IC109 or IC110.
IC114 : 1 Mbit of SRAM
IC102 : RISC CPU

(SRAM Control Circuit)



(3) Description of Operation

Writing of CCD image data in SRAM :

The image data on the CCD is converted to digital data by IC303 and output in synchronization with the signals at HTCLK and S2 terminals of IC303.

IC109 and IC110 form a counter which counts up on receiving the HTCLK signal and generates the address in SRAM where the data is to be written.

Since the reset of the counter is released at writing start, the image data are written in the order of images which are output one by one from address 0 in SRAM. During this operation, the A0 to A16 and D0 to D7 terminals of the RISC CPU are set to Hi-Z.

Read-in by RISC CPU of CCD image data from SRAM :

IC303, IC109 and IC110 are disconnected from SRAM by setting the D0 to D7 terminals of IC303 to Hi-Z and by turning OFF the buffer of IC111 to IC113 by the GATEC signal. Upon this, SRAM functions as the external RAM of the RISC CPU.

9. CCD Drive Circuit + Signal Processing Circuit

(1) Outline

The direct control of CCD drive is performed by the Gate Array (IC303). The Gate Array is controlled by the RISC CPU (IC102). The RISC CPU sets the register of the Gate Array by serial communication and controls accumulation start and transfer start by the signals at the STTRG and TSTART terminals. On receiving the signal from the RISC CPU, the Gate Array outputs the signals to the NSUBC, VI and VSDHT terminals of IC303 to drive the CCD. The signal output from the CCD is input to the CCDIN terminal of the Gate Array. This CCD signal is output from the YOUT terminal once, undergoes signal processing in the Clip Circuit and Amplifying Circuit and again is input to the YIN terminal of IC303, and is converted to digital data in the Gate Array.

(2) Description of Functions

IC302 :

This is a level shifter which shifts the VI and VS signal voltage (0 to 5 V) output from the Gate Array to the voltage of – 10 to 5 V.

NSUB Voltage Adjusting Circuit :

This circuit generates NSUB pulse from the NSUB signal. The amplitude of the NSUB pulse is adjusted by turning the adjuster of VR301. The sensitivity of the CCD can be adjusted by changing the amplitude of the NSUB pulse ; the smaller the amplitude, the higher the sensitivity.

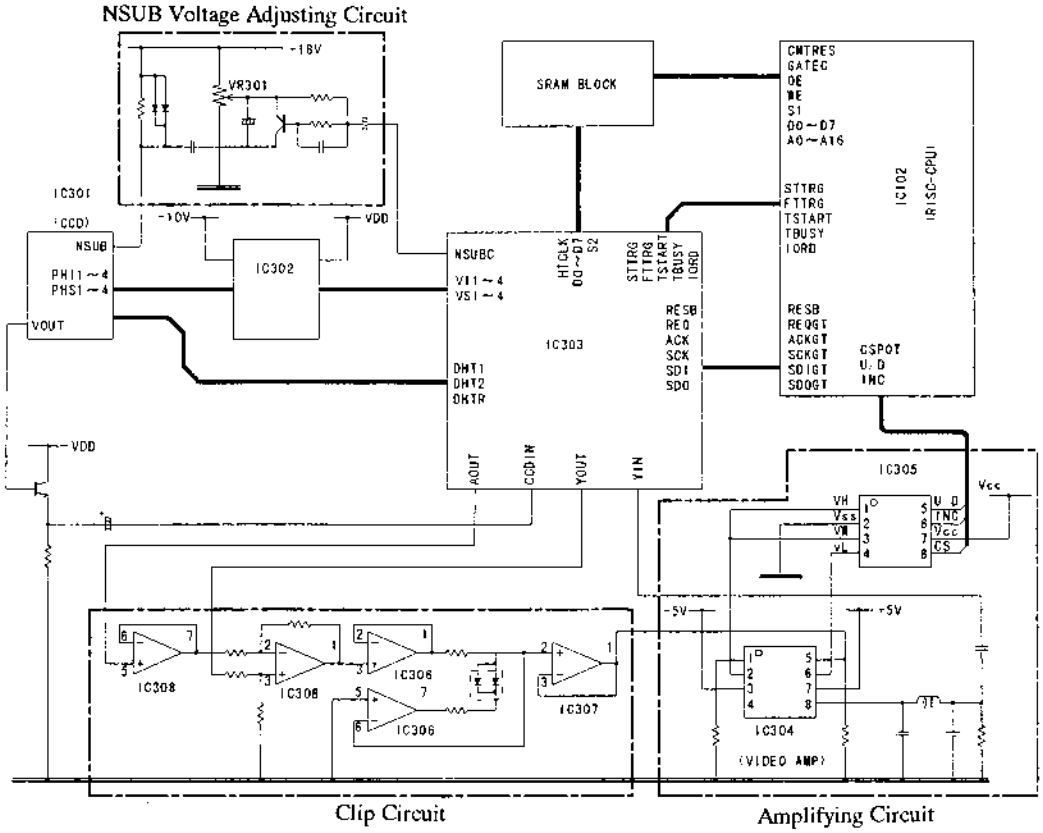
Clip Circuit :

This circuit cuts the unnecessary signal level to enhance AF performance. The level to be cut is determined by the voltage at AOUT and this voltage is controlled by the setting of the register of the Gate Array (IC303).

Amplifying Circuit :

This circuit amplifies a small-amplitude signal to enhance AF performance. Amplification is performed by the Video Amplifier (IC304). A change in amplification gain is achieved by changing the resistance value of the Electronic Adjuster (IC305) located between Pin 2 and Pin 6 of IC304. The resistance value of the Electronic Adjuster is controlled by the RISC CPU.

(CCD Drive Circuit + Signal Processing Circuit)

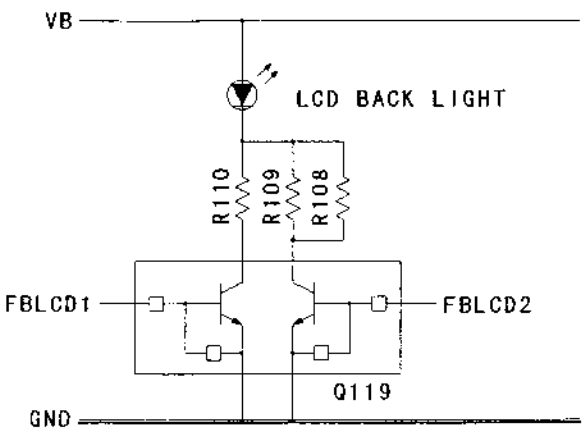


10. LCD Back Light Circuit

(1) Circuit Constitution

This circuit consists of the LCD Back Light, R108, R109, R110 and Q119.

(LCD Back Light Circuit)



(1) Description of Functions

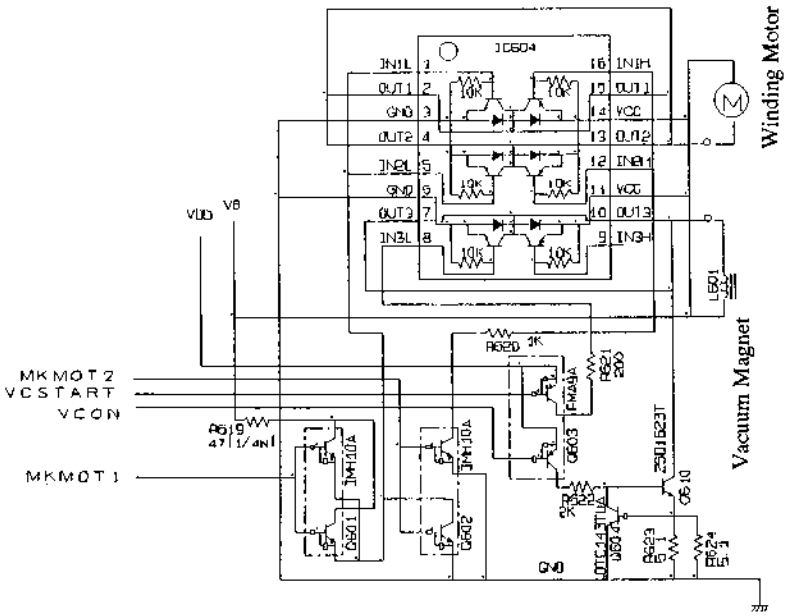
The two transistors in Q119 are turned ON/OFF by the signals output from the FBLCD1 (Pin 19) and FBLCD2 (Pin 18) terminals of the RISC CPU. The current flowing in the LCD Back Light is controlled by combinations of "H" and "L" signals output from FBLCD1 and FBLCD2 to change the brightness of the Back Light.
The brightness of the Back Light is controlled in three steps according to the center-weighted average metering value. When the AE Prism Finder has not been mounted, the brightness is controlled based on the spot light metering value.

FBLCD1	FBLCD2	Brightness of Back Light
H	H	High brightness
L	H	Medium brightness
H	L	Low brightness
L	L	Not lighted

⟨Major Circuits in Film Back⟩

1. Winding Drive Circuit / Vacuum Circuit

(1) Circuit Constitution



(2) Description of Functions

Control of film winding (including blank shots advance and advance to the film end) is carried out by predriving the transistor array of IC604 by the transistors Q601 and Q602.
Control of the motor is performed by controlling the base of the predriving transistors Q601 and Q602 from the MKMOT1 (Pin 16) and MKMOT2 (Pin 18) ports of the Film Back CPU.
Vacuum operation is controlled by two circuits — one which is used at the start of vacuum operation to predrive the NPN transistor, which is the remaining transistor of IC604, by one transistor of Q603, and the other which performs low-current control by controlling the base voltage of Q604. At the start of vacuum operation, to enhance the vacuum effect, a large current is supplied by turning the VCSTART port (Pin 20) of the CPU = "L". 15 msec after start of vacuum, that is, when a steady vacuum has been established, operation is switched to constant-current control for power saving by turning VCSTART (Pin 20) of the CPU = "H" and VCONT (Pin 19) of the CPU = "L".

(Winding Motor)

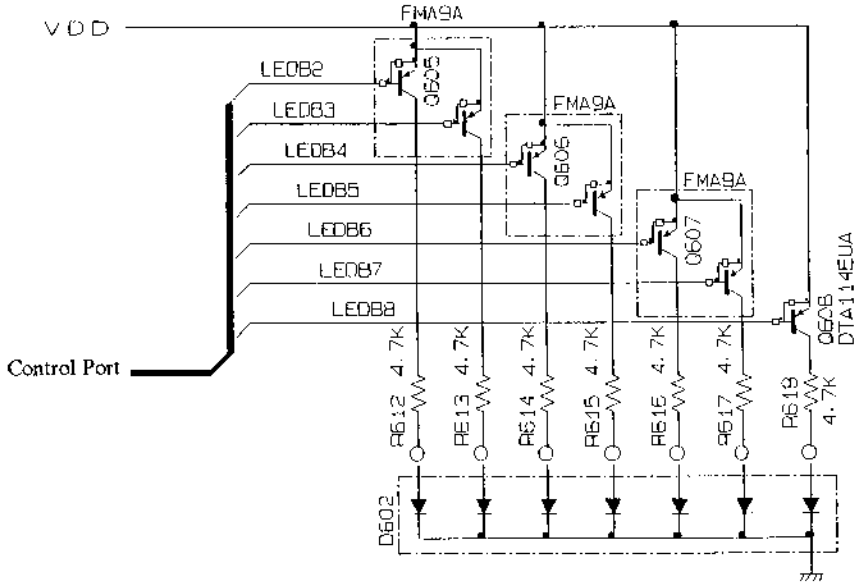
MKMOT1 (Pin 16 of CPU)	MKMOT2 (Pin 18 of CPU)	Drive State of Winding Motor
L	L	Motor free
H	L	Motor forward run
L	H	Not used
H	H	Short brake

(Vacuum Magnet)

VCSTART (Pin 20 of CPU)	VCONT (Pin 19 of CPU)	Drive State of Vacuum Magnet
L	H	ON at vacuum start
H	L	During constant-current vacuum control
L	H	Not used
H	H	Vacuum Magnet free

2. Imprinting Circuit

(1) Circuit Constitution

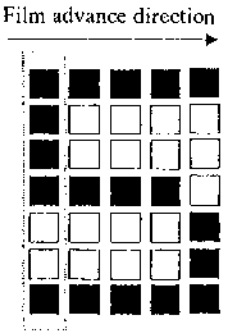


(2) Description of Functions

Imprinting control is performed by controlling the lighting/putting out of a set of seven LEDs (D602). The LEDs are linked with the control ports LED1 to LED7 (Pin 21, Pin 22, Pin 24 to Pin 28) of the Film Back CPU, respectively. The seven LEDs have the common cathode which is connected to the ground. The anode of each LED is connected to VDD via a PNP transistor. The CPU controls the lighting of each LED by controlling the base of the corresponding transistor.

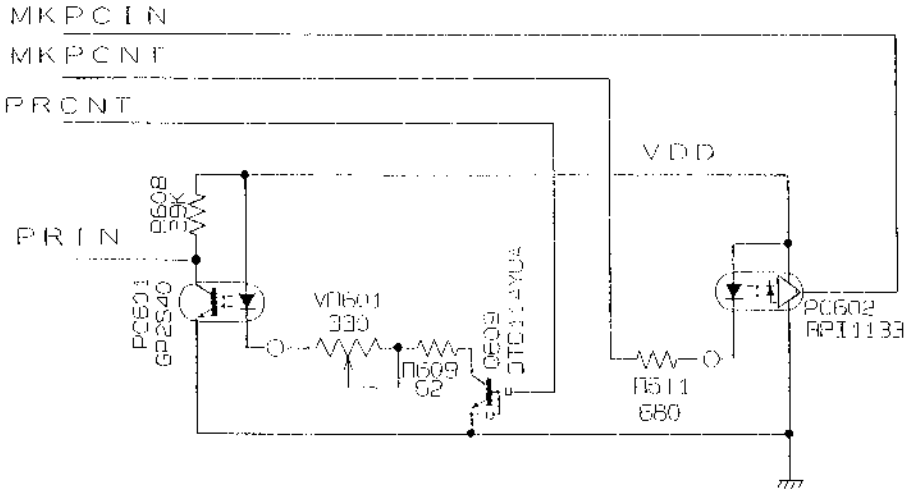
For imprinting, one character, consisting of 7 dots × 5, is formed by controlling five times the turning ON/OFF of each of the 7 LEDs. When CPU port = "H", the LED turns OFF (when "L", the LED turns ON).

Example : Imprinting of 5



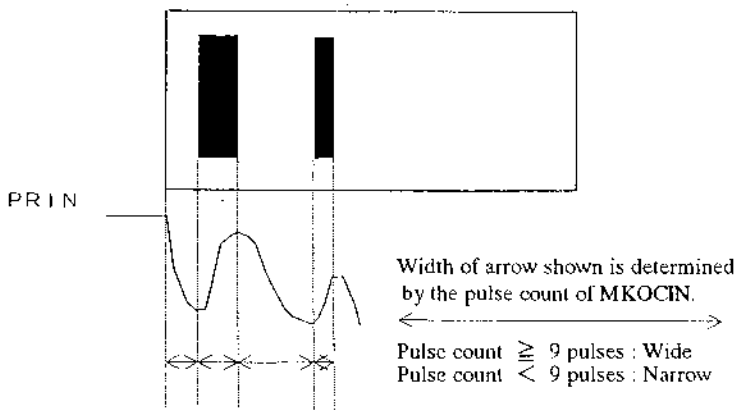
3. Bar Code Readout Circuit

(1) Circuit Constitution



(2) Description of Functions

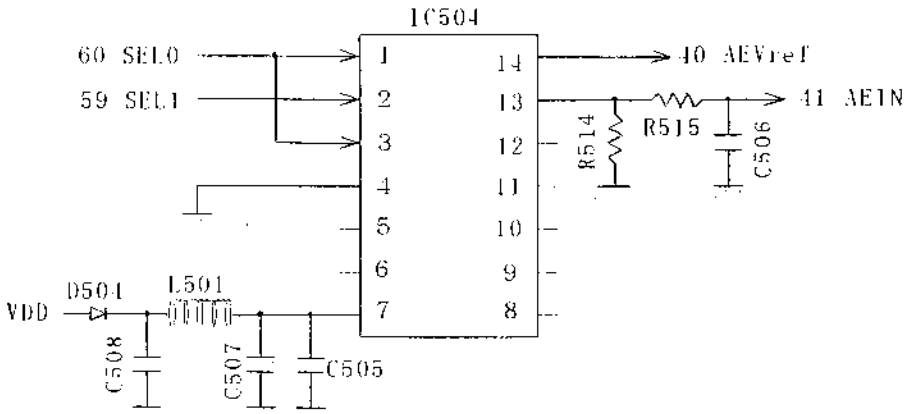
Bar code readout is performed only while the Film Back is operating for blank shots advance.
For bar code readout, first the signal at the PRCNT terminal (Pin 15) of the Film Back CPU is turned "H" and thus the transistor Q609 is turned ON to light the LED of the Photo-reflector (PR). The light from the PR-LED is reflected by the bar code surface of the film and the reflected light is received by the transistor of the Photo-reflector. Since the reflected light varies with black/white on the bar code, the base current of the PR-Transistor also varies and resultantly the output of the PR-Transistor changes. This output is judged by the PRIN terminal (Pin 43) (A/D input port) of the Film Back CPU and white/black of the bar code is identified. The bar code is recognized by combinations of widths of black and white stripes. To recognize the width, the MKPCNT terminal (Pin 14) of the Film Back CPU is turned "L", the Photo-coupler (PC) is lighted and the winding pulse is input to the MKPCIN terminal (Pin 31) of the CPU by the encoder coupled with winding operation. Through these two light receiving elements (PR and PC), the Film Back CPU identifies the black/white on the bar code and the width.


PRIN
Width of arrow shown is determined by the pulse count of MKOCIN.
Pulse count ≧ 9 pulses : Wide
Pulse count < 9 pulses : Narrow

〈Major Circuits in AE Prism Finder〉

1. Average Light Metering

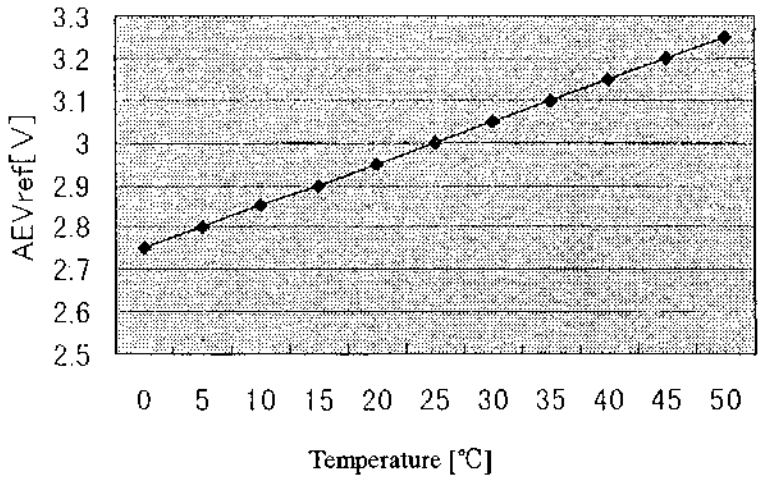
(1) Circuit Constitution



* The numbers in the diagram represent the corresponding terminal numbers of the RISC CPU.

(2) Description of Functions

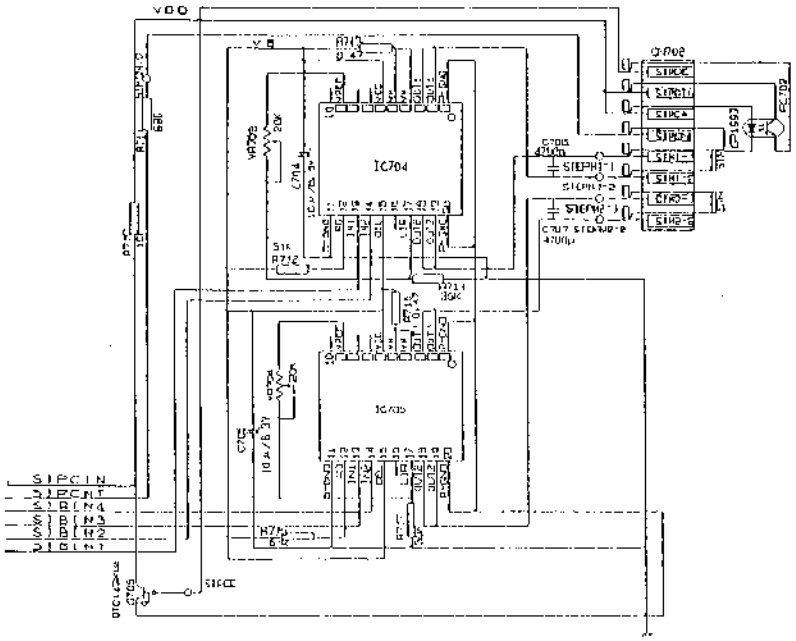
① The Light Metering IC (IC504) is located below the eyepiece of the AE Prism Finder.
② From the Light Metering IC, a light metering voltage corresponding to the brightness is output through the AEIN terminal (Pin 13) and the reference voltage for A/D conversion is through the AEVref terminal (Pin 14).
③ Both the AEIN and AEVref signals are output at levels in proportion to the absolute temperature.
④ The light metering output changes by 90 mV when the brightness varies by 1 EV.
⑤ The light metering output is passed through a filter consisting of resistors and capacitors for noise removal.
⑥ By the CPU in the AE Prism Finder, A/D conversion is made and arithmetic operation of light metering brightness is carried out.
⑦ An error in light metering has been adjusted for each camera and has been stored as adjustment data.
⑧ The SEL0 and SEL1 signals are fixed to "H".
⑨ For the power supply VDD, a filter consisting of coils and capacitors is incorporated for noise removal.



〈Major Circuits in Lens〉

1. Aperture Drive Circuit

(1) Circuit Constitution



(2) Description of Functions

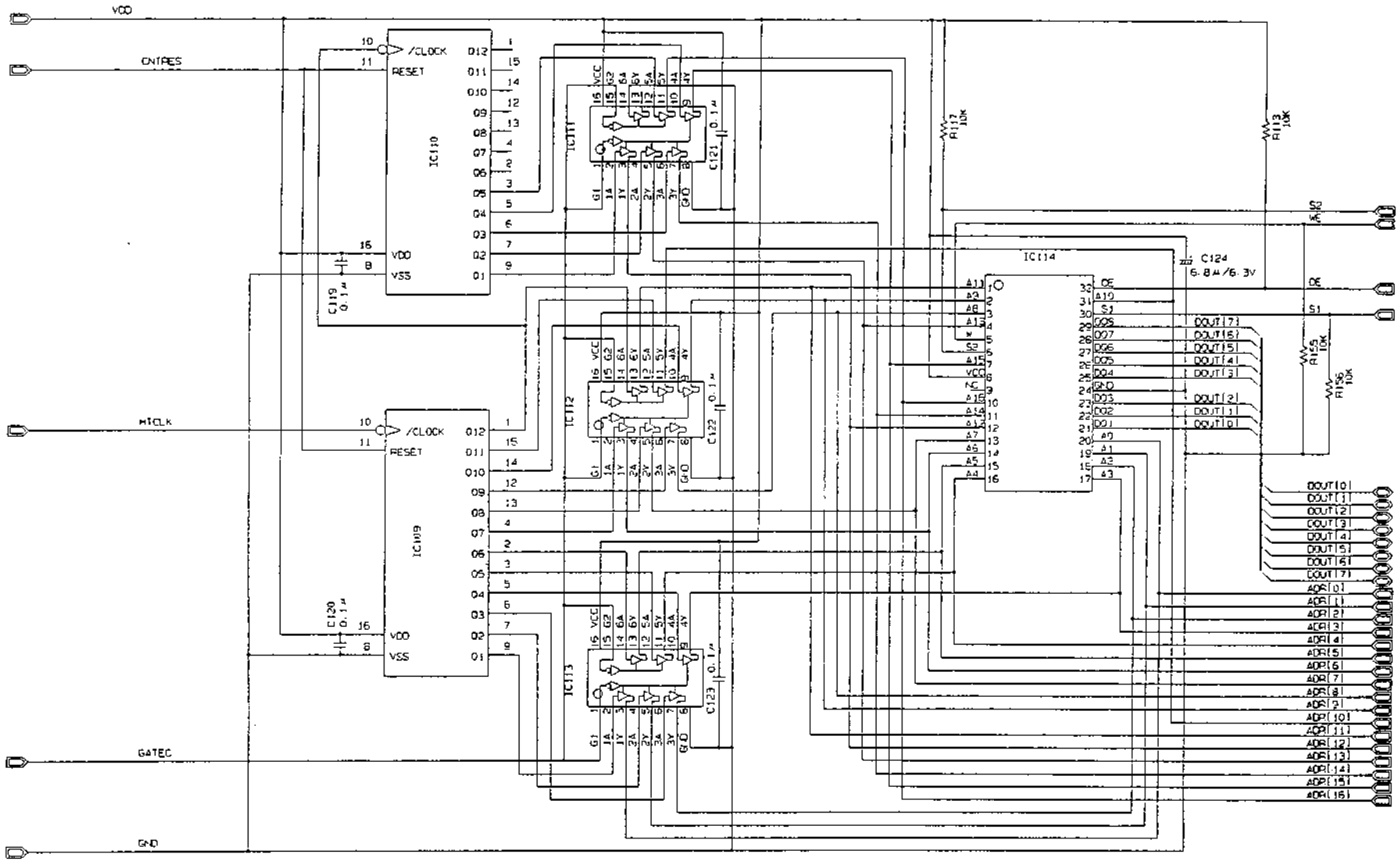
Aperture drive is controlled by pulse output from the four output terminals SIBIN1 to SIBIN4 of the Lens CPU. The signals from the output terminals of the CPU are input to two constant-current ICs (IC704 and IC705) and two outputs from each constant-current IC, or four outputs in total, are connected to the Aperture Motor.
The Variable Resistors VR703 and VR704 connected to the constant-current ICs are intended to adjust the current output from the respective constant-current ICs. (Adjusted in manufacturing stage = about 230 mA)
The Transistor Q705 rectifies the waveform of the output from the Aperture Photo-coupler and input it to the SIPCIN terminal of the CPU.
The Aperture Photo-coupler PC702 detects only the start of aperture change from the initial position. During pulse drive, therefore, open-loop control by pulse count is carried out.
The relationship between the amount of stop down and pulse count is such that 1/8 AV = 1 pulse. (Reference position : full-open position for every Lens)
Since the pulse count to the position where aperture is stopped down by 1/8 from the full-open position varies with the Lens, such variation is adjusted by software

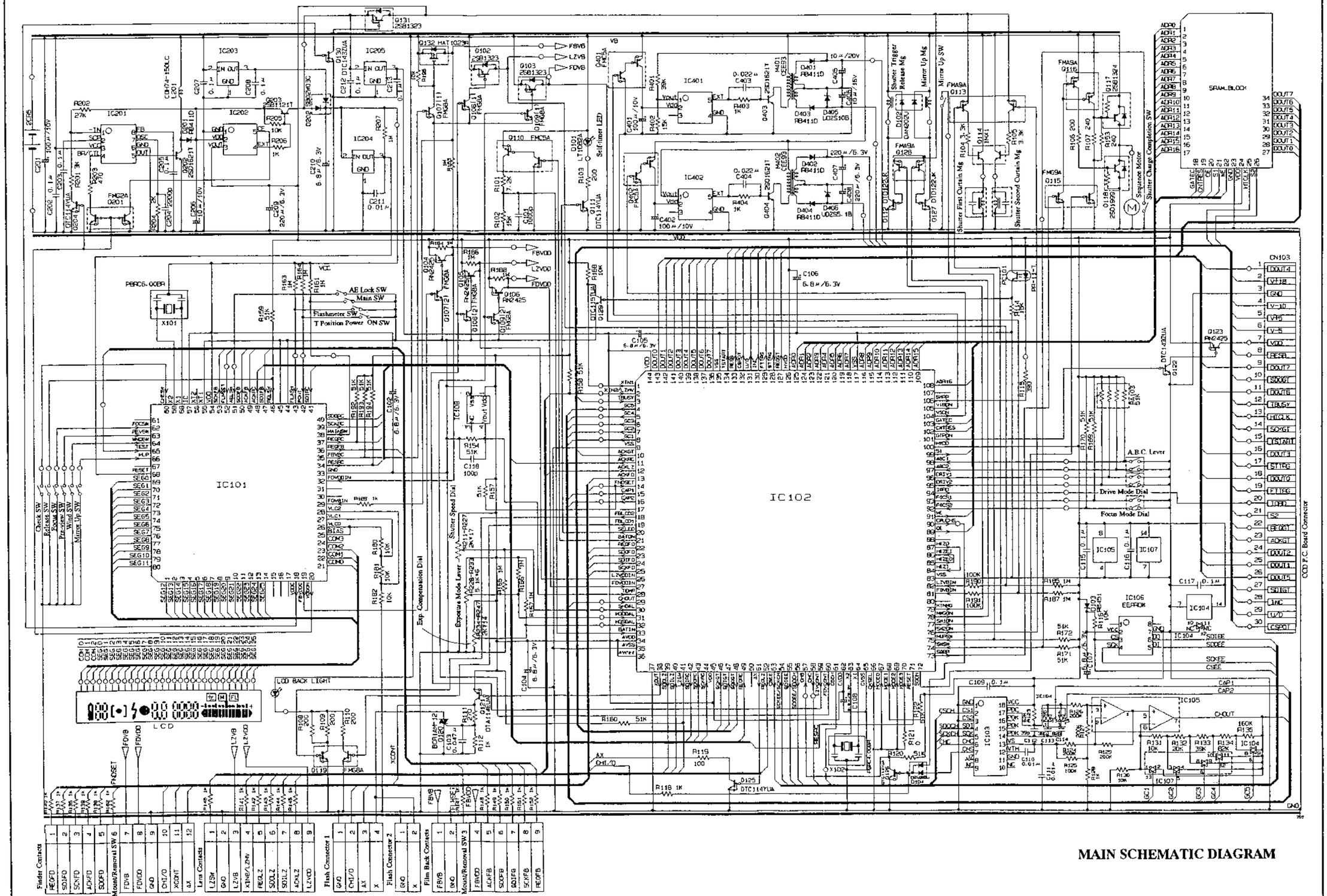
(Comparison between Signals at CPU Ports and Aperture Pulses)

CPU Terminal				Aperture Motor			
SIBIN	SIBIN2	SIBIN3	SIBIN4	VO1	VO2	VO3	VO4
L	L	L	L	L	L	L	L
L	H	L	H	H	L	H	L
L	H	H	L	H	L	L	H
H	L	H	L	L	H	L	H
H	L	L	H	L	H	H	L

The pulse width also varies ranging 0.5 msec to 5 msec, depending on the aperture position. This variation is also coped with by processing on software.

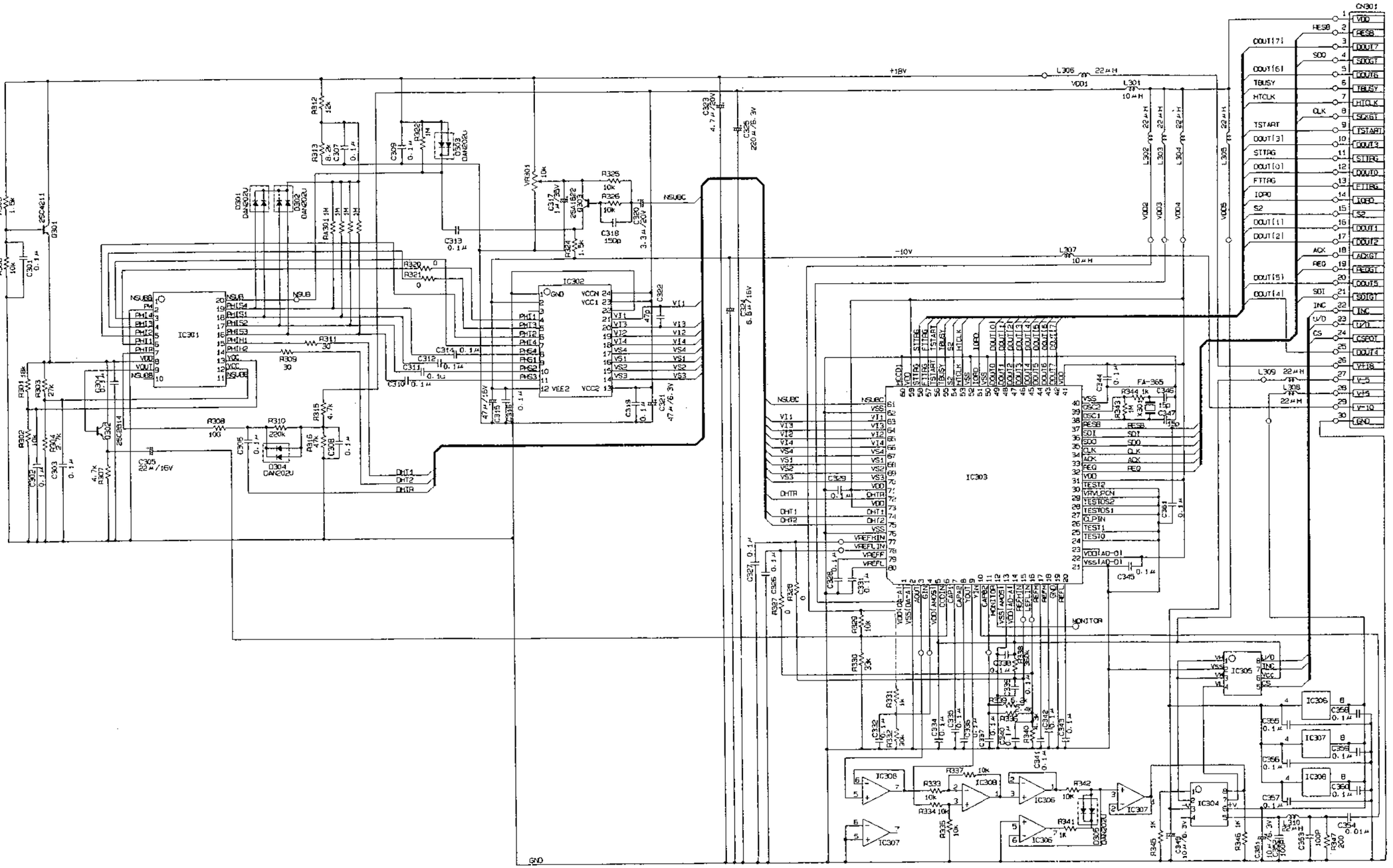
SRAM BLOCK SCHEMATIC DIAGRAM



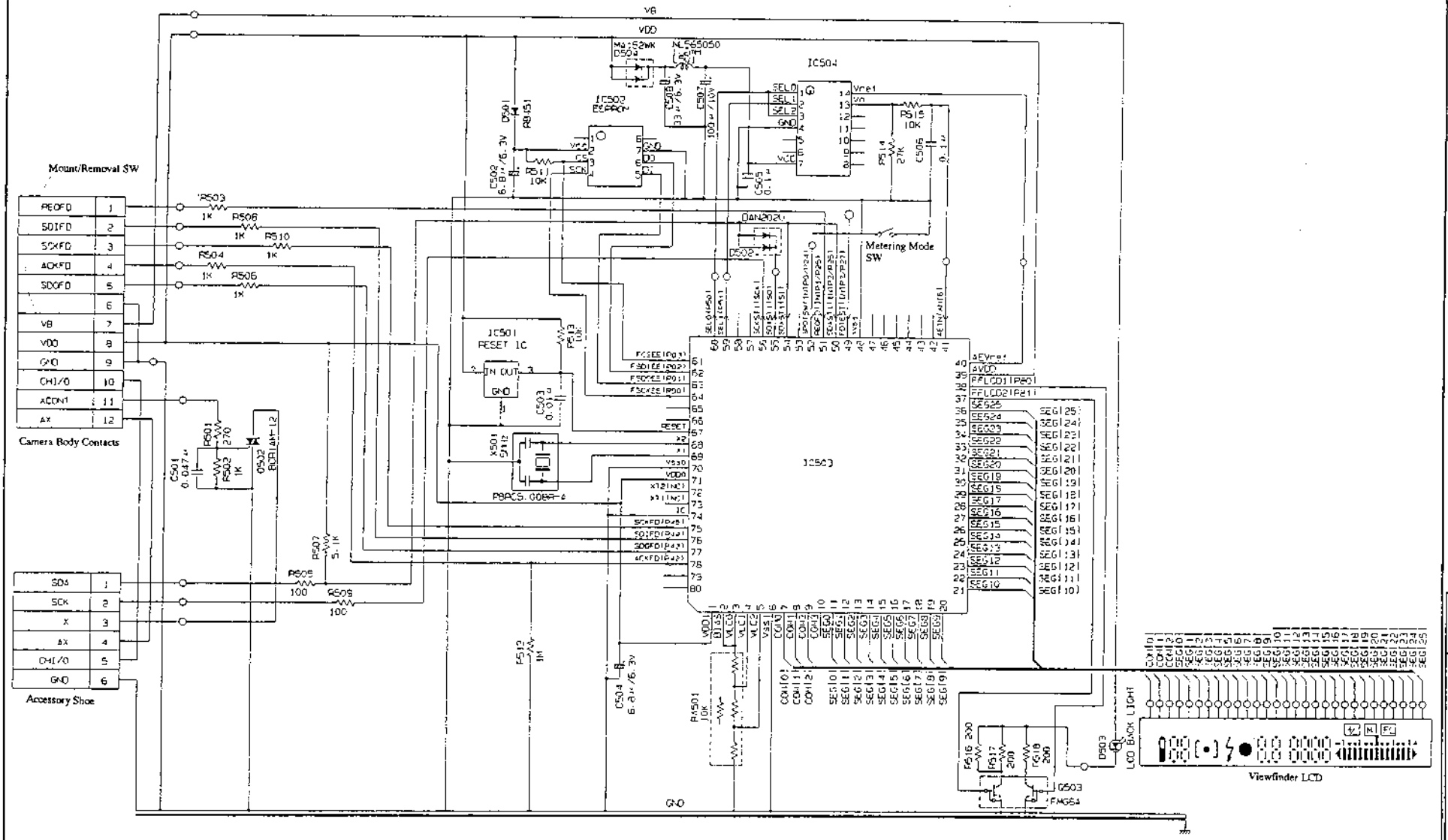


MAIN SCHEMATIC DIAGRAM

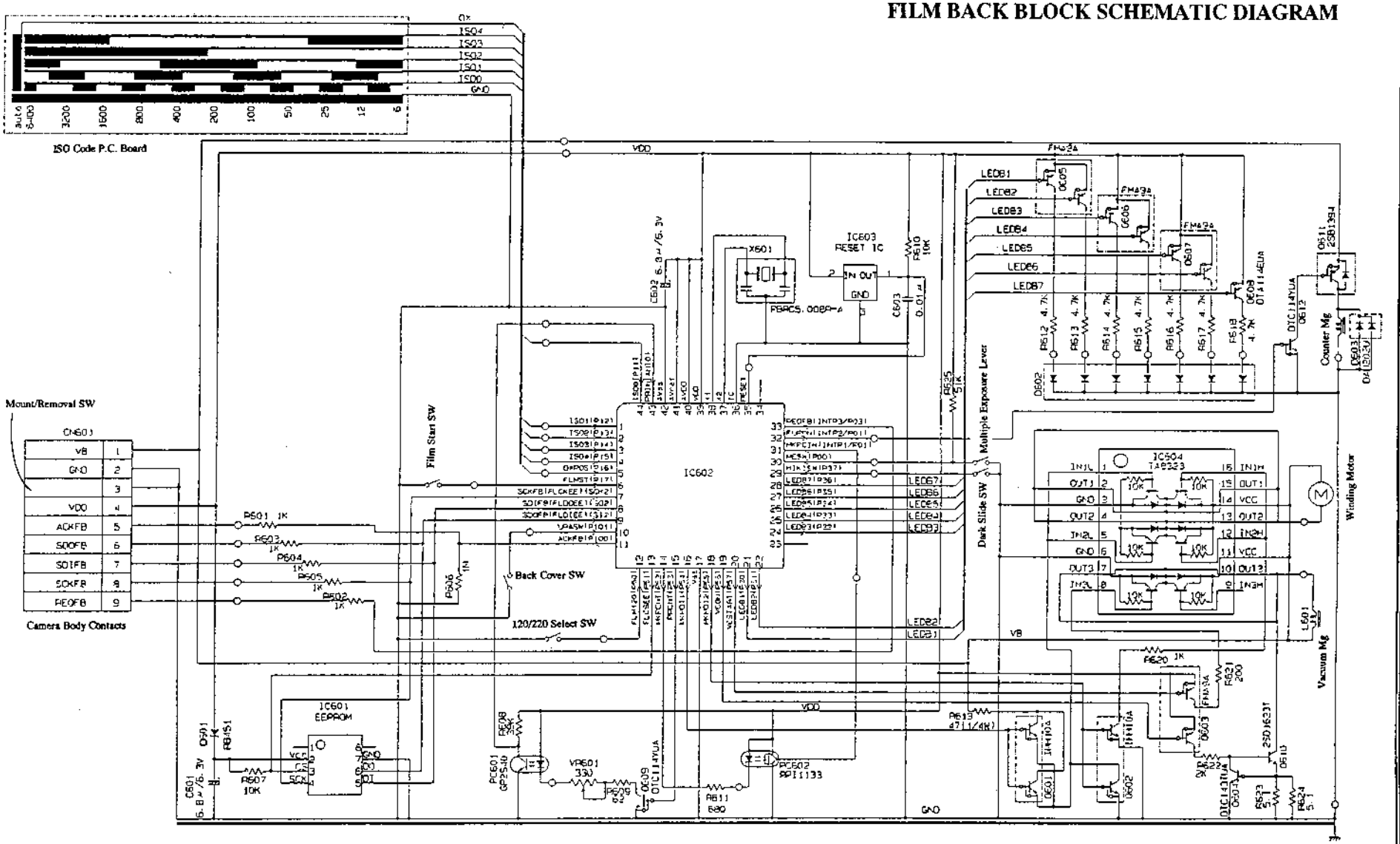
SCHEMATIC DIAGRAM of CCD P.C. BOARD



FINDER BLOCK SCHEMATIC DIAGRAM



FILM BACK BLOCK SCHEMATIC DIAGRAM



No.	419-01-41-RA1AU01

B. DISASSEMBLY & REASSEMBLY PROCEDURES

B-1. REMOVAL OF EXTERIOR UNITS

B-1-1. Removal of AE Prism Finder Ass'y

(See Figs. 1 and 2)

1) While turning the Finder Removing Lever in the direction of the arrow Ⓐ, slide the AE Prism Finder Ass'y backward (in the direction of the arrow Ⓑ).
2) Align the attaching index " • " of the AE Prism Finder with the attaching index " ▮ " on the Camera Body and remove the AE Prism Finder Ass'y by pulling it up.

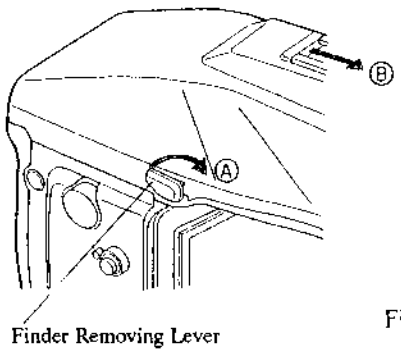


Fig. 1

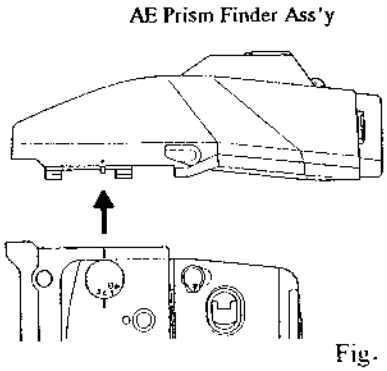


Fig. 2

B-1-2. Removal of Film Back Ass'y

(See Fig. 3)

1) Pull the Dark Slide (1AU40100) out of the Dark Slide Pocket and insert it into the Dark Slide Insertion Point until the Dark Slide is locked in the deepest position.

   Note :

   - If the Dark Slide has not been inserted fully into the Dark Slide Insertion Point, the safety lock will prevent removal of the Film Back from the Camera Body.

2) Turn the Film Back Lock Button in the direction of the arrow Ⓐ and press it in, then pull the Film Back Ass'y off in the direction of the arrow Ⓑ.

   Note :

   - The Shutter Curtains are made with precision. When the Film Back Ass'y has been removed, take care never to touch the curtains with your finger nor push them with the film end or anything else.

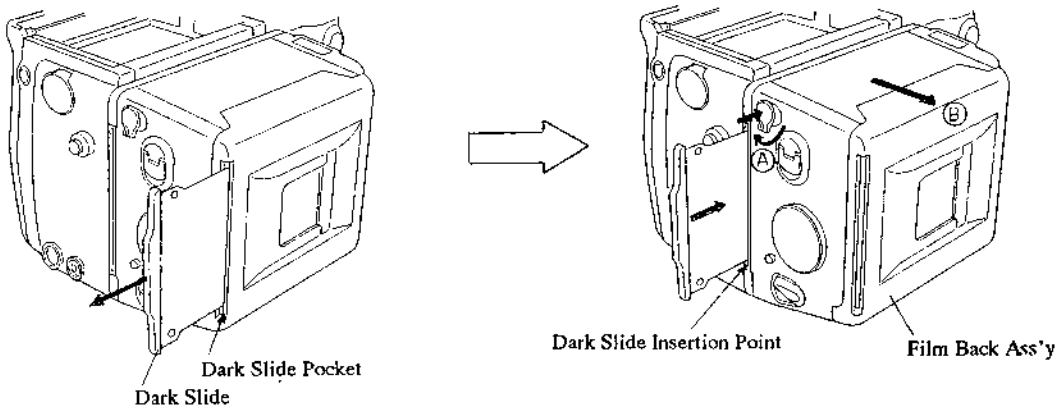


Fig. 3

B-2. REMOVAL OF EXTERIOR PARTS FROM CAMERA BODY

[Chart for Removal of Exterior Parts from Camera Body]

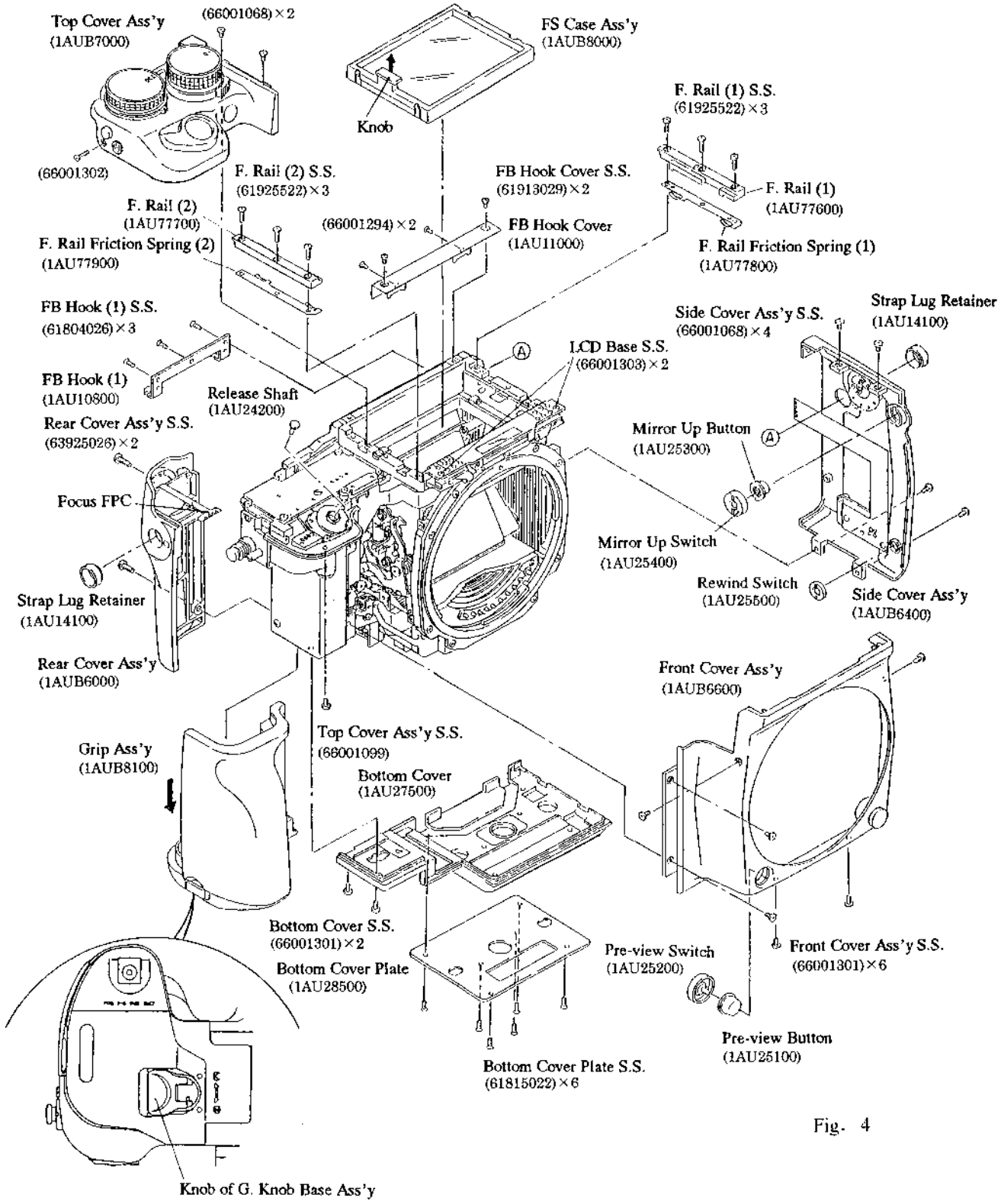


Fig. 4

B-2-1. Removal of Grip Ass'y

(See Fig. 4)

1) Raise the knob of the G. Knob Base Ass'y on the bottom of the Camera Body and turn the knob so as to set the mark " • " at " ⌄ ". (ⓤ → ⌄)
2) Remove the Grip Ass'y (1AUB8100) by sliding it down.

B-2-2. Removal of FS Case Ass'y

(See Fig. 4)

1) Hold the knob of FS Case Ass'y (1AUB8000) between your fingers and pull up gently to remove it.

Note :

- Take care not to flaw the Focusing Screen.

B-2-3. Removal of Top Cover Ass'y

(See Fig. 4)

1) Remove the FB Hook Cover Setscrews (61913029) × 2, (66001294) × 2 and take off the FB Hook Cover (1AU11000).
2) Remove the FB Hook (1) Setscrews (61804026) × 3 and take off the FB Hook (1) (1AU10800).
3) Remove the F. Rail (2) Setscrews (61925522) × 3 and take off the F. Rail (2) (1AU77700), F. Rail Friction Spring (2) (1AU77900).
4) Remove the Top Cover Ass'y Setscrews (66001099), (66001302), (66001068) × 2 and take off the Top Cover Ass'y (1AUB7000).
5) Remove the Release Shaft (1AU24200).

Note :

- When the Top Cover Ass'y (1AUB7000) has been removed, take care not to lose the Release Shaft (1AU2 4200).

[Installation Procedure for Top Cover Ass'y]

1) Set the Main Switch Lever in the "ON" position.
2) Set the cut portion of the Main Contact Base Ass'y (1AUB5100) exactly in the direction of the front of the camera. (See Fig. 5)
3) Install the Top Cover Ass'y while fitting the pin of Main Switch Lever in the cut portion of the Main Contact Base Ass'y.

B-2-4. Removal of Rear Cover Ass'y

(See Fig. 4)

1) Unsolder the 4 soldered joints between the Main FPC and the Focus FPC. (See Fig. 5)
2) Remove the Strap Lug Retainer (1AU14100) on the left side of camera body.

Note :

- Remove the Strap Lug Retainer with care not to flaw the Strap Lug Retainer or the Rear Cover Ass'y.

3) Remove the Rear Cover Ass'y Setscrews (63925026) × 2, push the Focus FPC under the Dial Base Plate and slide the Rear Cover Ass'y (1AUB6000) in the direction of the arrow to remove it.

Note :

- When removing the Rear Cover Ass'y, take care not to break the Focus FPC.

B-2-5. Removal of Front Cover Ass'y

(See Fig. 4)

1) Loosen the LCD Base Setscrews (66001303) × 2.
2) Remove the Front Cover Ass'y Setscrews (66001301) × 6 and take off the Front Cover Ass'y (1AUB6600).
3) Remove the Pre-view Switch (1AU25200) and Pre-view Button (1AU25100).

B-2-6. Removal of Bottom Cover

(See Fig. 4)

1) Remove the Bottom Cover Plate Setscrews (61815022) × 6 and take off the Bottom Cover Plate (1AU28500).
2) Remove the Bottom Cover Setscrews (66001301) × 2 and take off the Bottom Cover (1AU27500).

B-2-7. Removal of Side Cover Ass'y

(See Fig. 4)

1) Remove the F. Rail (1) Setscrews (61925522) × 3 and take off the F. Rail (1) (1AU77600) and F. Rail Friction Spring (1) (1AU77800).
2) Remove the Strap Lug Retainer (1AU14100) on the right of camera body.

Note :

- Remove the Strap Lug Retainer with care not to flaw the Strap Lug Retainer or Side Cover Ass'y.

3) Remove the Side Cover Ass'y Setscrews (66001068) × 4 and take off the Side Cover Ass'y (1AUB6400).
4) Remove the Rewind Switch (1AU25500), Mirror Up Switch (1AU25400) and Mirror Up Button (1AU25300).
5) Unsolder the 4 soldered joints between the R. P.C. Board and the Flash Socket Coupling FPC and remove the Side Cover Ass'y. (See Fig. 5)

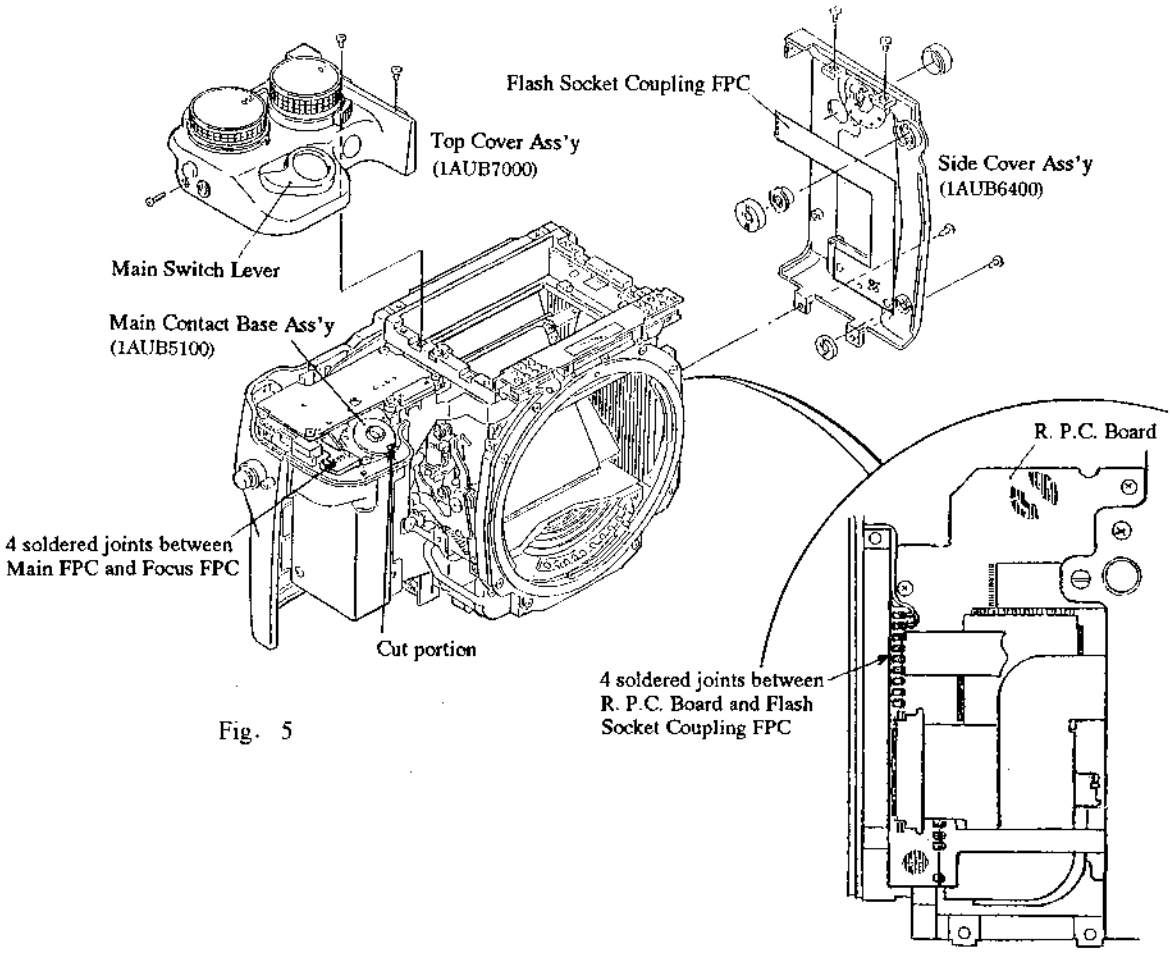


Fig. 5

B-3. REMOVAL OF MOUNT BASE ASS'Y

[Chart for Removal of Mount Base Ass'y]

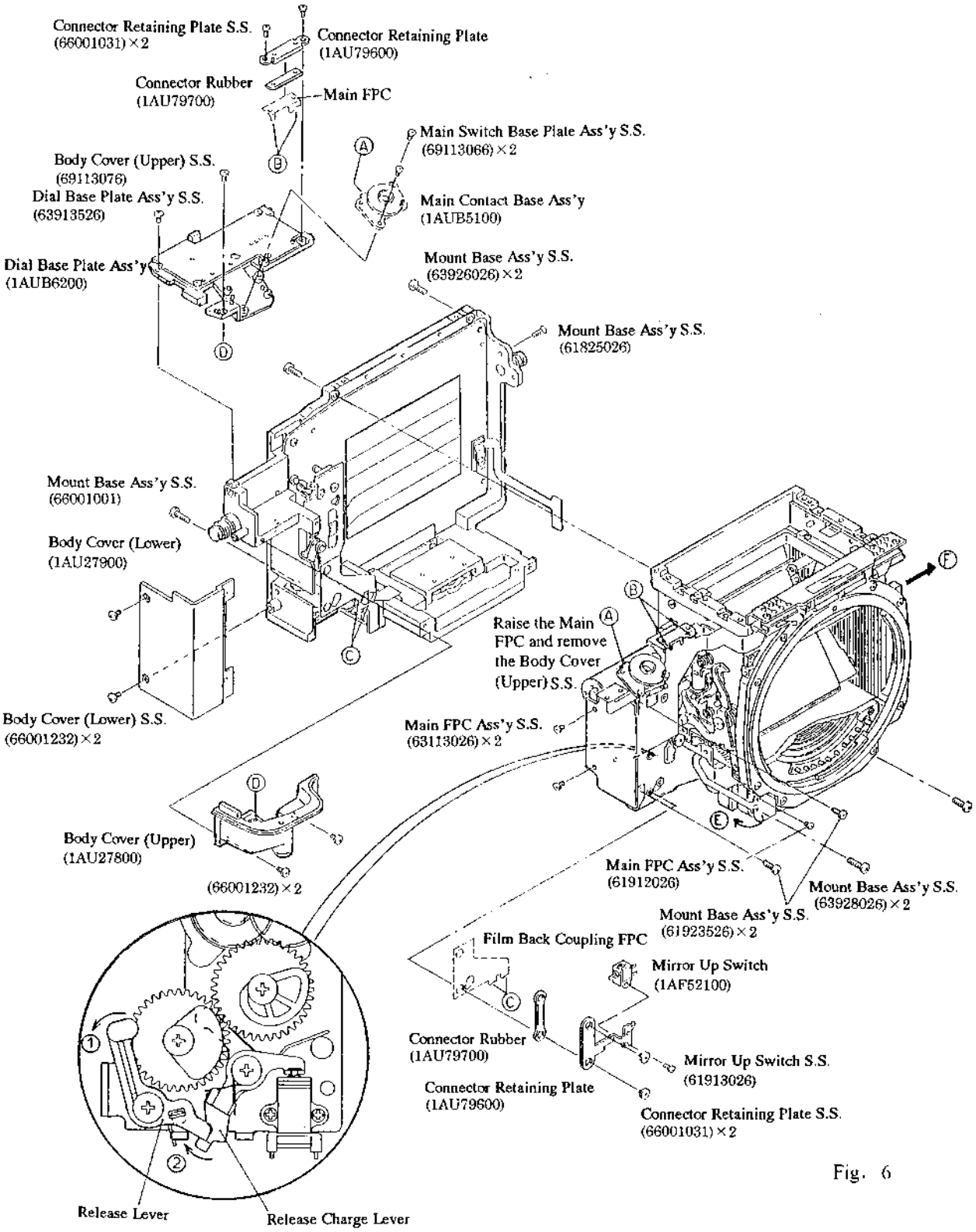


Fig. 6

B-3-1. Removal of Body Covers

(See Fig. 6)

1) Remove the Body Cover (Lower) Setscrews (66001232) × 2 and take off the Body Cover (Lower) (1AU2 7900).
2) Raise the Main FPC and remove the Body Cover (Upper) Setscrew (69113076).
3) Remove the Body Cover (Upper) Setscrews (66001232) × 2 and take off the Body Cover (Upper) (1AU2 7800).

B-3-2. Removal of Mount Base Ass'y

(Front Left of Camera Body) (See Figs. 6 and 7)

1) Unsolder the White, Yellow and Purple lead wires (from Shutter Unit).
2) Unsolder the two Black lead wires (from Main FPC) on the Mirror Up Switch (Timing Switch).
3) Remove the Connector Retaining Plate Setscrews (66001031) × 2 and take off the Connector Retaining Plate (1AU79600) and Connector Rubber (1AU79700).
4) Remove the Mirror Up Switch Setscrew (61913026) and take off the Mirror Up Switch (1AF52100).
(Left of Camera Body)
5) Unsolder the Orange and Brown lead wires (from Film Back Coupling FPC).
6) Unsolder the Purple, Gray, Pink and Yellow lead wires (from TTL Flash Auto Control FPC).
7) Remove the Main FPC Ass'y Setscrews (63913026) × 2.
(Right of Camera Body)
8) Unsolder the 4 soldered joints between the R. P.C. Board and the Unexposure P.R. FPC.
(Top Left of Camera Body)
9) Remove the Main Contact Base Plate Ass'y Setscrews (69113066) × 2.
10) Remove the Dial Base Plate Ass'y Setscrew (63913526) and take off the Dial Base Plate Ass'y (1AUB6200).
(Right of Camera Body)
11) Remove the Mount Base Ass'y Setscrew (61825026).
(Lower Front of Camera Body)
12) Remove the Mount Base Ass'y Setscrews (61923526) × 2.
13) Remove the Main FPC Ass'y Setscrew (61912026) and raise the Main FPC in the direction of the arrow Ⓔ.
Remove the Mount Base Ass'y Setscrews (63928026) × 2.
Note :
- Take care, since the Main FPC Ass'y is fixed to the Mount Base with double-stick tape.

(Rear of Camera Body)
14) Remove the Mount Base Ass'y Setscrews (66001001), (63926026) × 2 and take off the Mount Base Ass'y.
Note :
- Take care, since the Main FPC at the bottom of the Camera Body is fixed to the Camera Body with double-stick tape.

[Notes on Installation of Mount Base Ass'y]

a) Move the Release Lever of the Charge Base Plate Ass'y in the direction of the arrow ① and move the Release Charge Lever in the direction of the arrow ② so that the Release Lever is hooked on the Release Charge Lever. Then install the Mount Base Ass'y on the Camera Body. (See Fig. 6)
b) When installing the Mount Base Ass'y on the Camera Body, take care not to catch any lead wires (especially, Purple and Yellow lead wires (from TTL Flash Auto Control FPC)) or FPC between the Camera Body and the Mount Base Ass'y.
c) After setting the Mount Base Ass'y on the Camera Body, push the Mount Base Ass'y as far to the right as possible (in the direction of the arrow Ⓕ). (See Fig. 6).

[Note on Replacing the Mirror Up Switch]

a) When repair requires replacing the Mirror Up Switch (1AF52100), cut off the boss on the back of the new Mirror Up Switch, using nippers or the like, and then install it in the Camera Body.

[Chart for Unsoldering on Main FPC Ass'y]

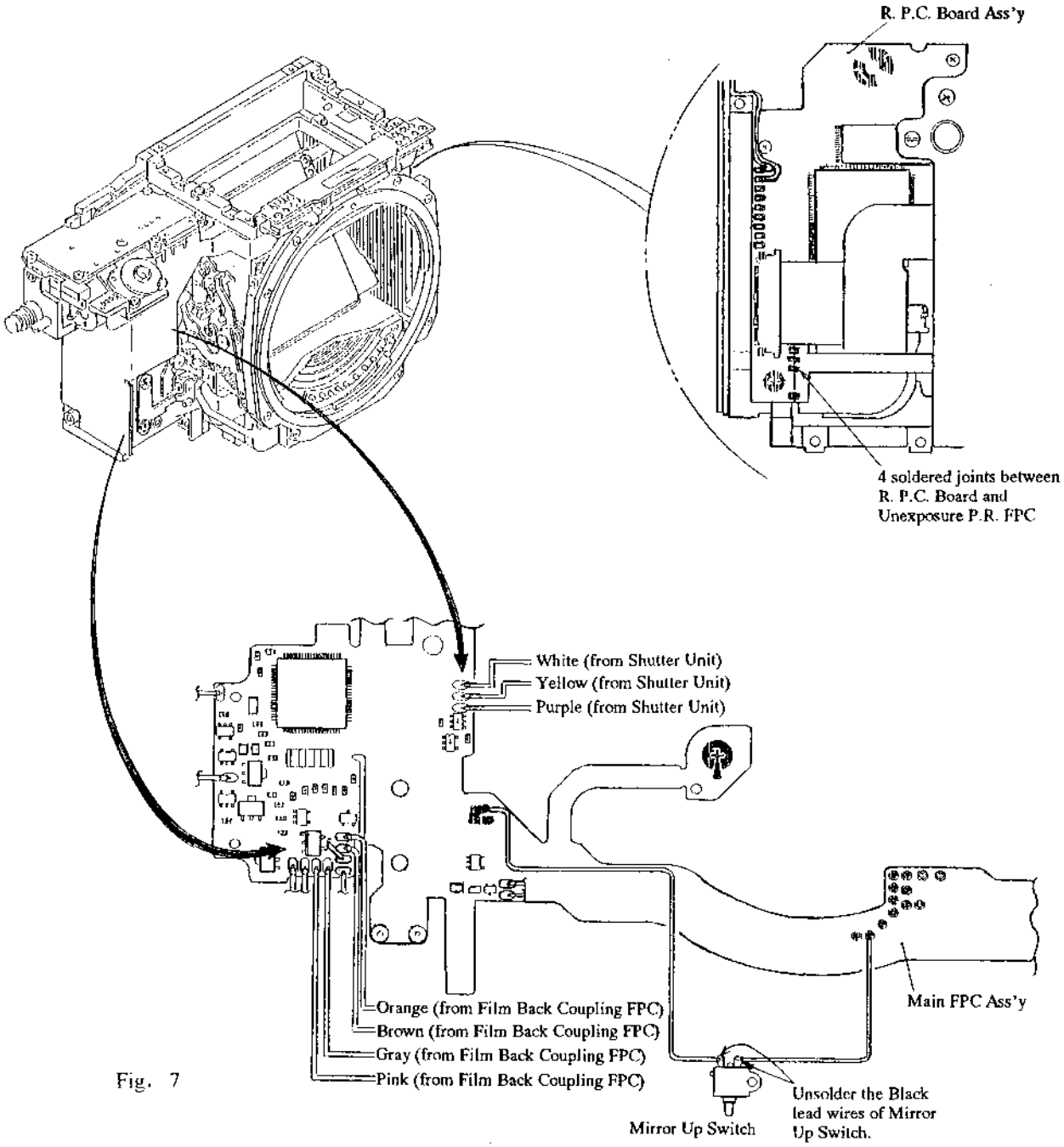

R. P.C. Board Ass'y
4 soldered joints between R. P.C. Board and Unexposure P.R. FPC
White (from Shutter Unit)
Yellow (from Shutter Unit)
Purple (from Shutter Unit)
Orange (from Film Back Coupling FPC)
Brown (from Film Back Coupling FPC)
Gray (from Film Back Coupling FPC)
Pink (from Film Back Coupling FPC)
Main FPC Ass'y
Mirror Up Switch
Unsolder the Black lead wires of Mirror Up Switch.

Fig. 7

B-3. REMOVAL OF OTHER PARTS FROM CAMERA BODY

[Chart for Removal of Other Parts from Camera Body]

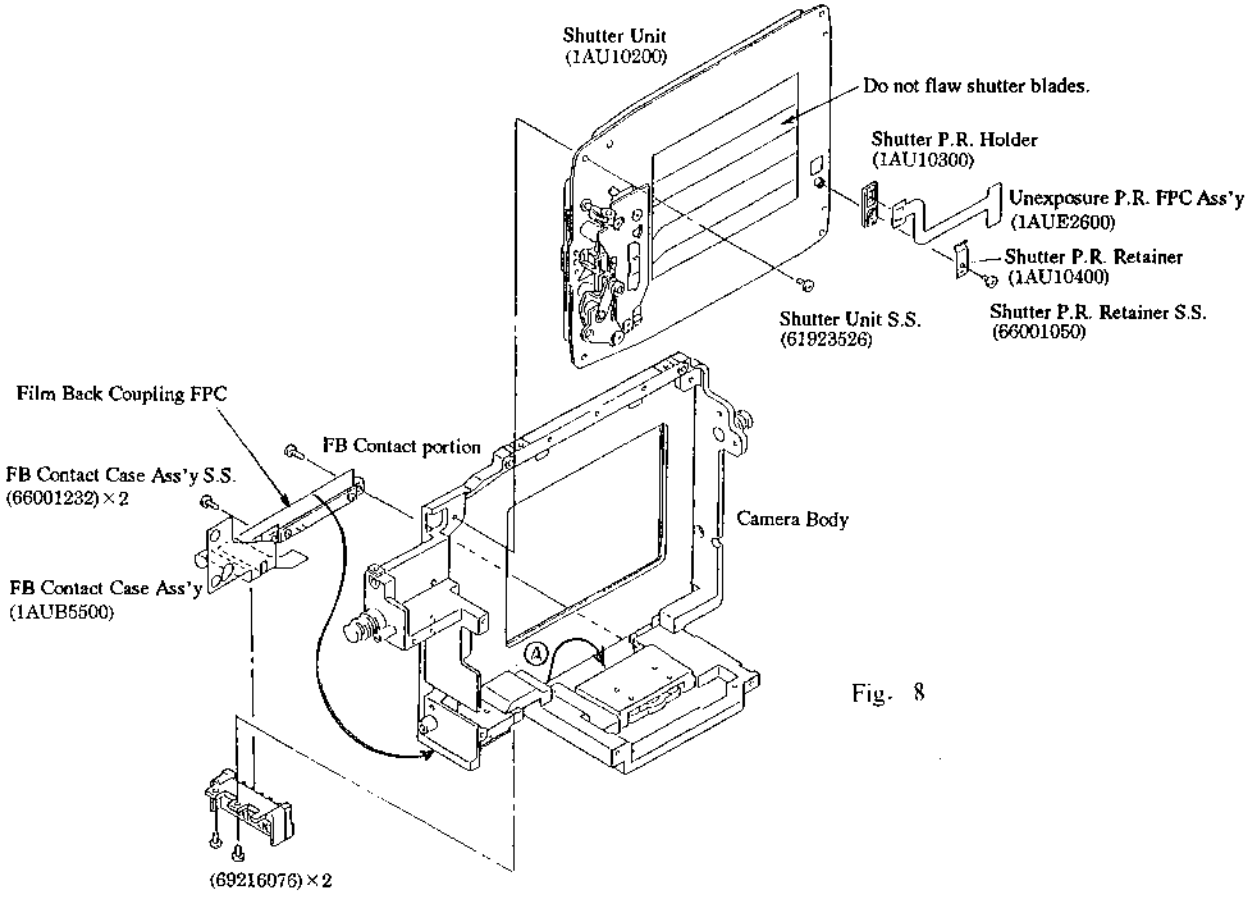


Fig. 8

B-3-1. Removal of Shutter Unit

(See Fig. 8)

1) Remove the Shutter Unit Setscrew (61923526) and take off the Shutter Unit (1AU10200).
2) Remove the Shutter P.R. Retainer Setscrew (66001050) and take off the Shutter P.R. Retainer (1AU10400), Unexposure P.R. FPC Ass'y (1AUE2600) and Shutter P.R. Holder (1AU10300).

[Notes on Handling of Shutter Unit]

a) The shutter blades are made with precision. Never touch the blades with your finger, nor push them with any tool.
b) Keep the shutter blades free from scratches, dirt, solder or flux.
c) When the shutter blades must be wiped with lens cleaning paper with a solvent (for example, ether alcohol), take due care.

[Notes on Installation of Shutter Unit]

a) When installing the Shutter Unit, take care not to catch the Film Back Coupling FPC of the FB Contact Case Ass'y.

B-3-2. Removal of FB Contact Case Ass'y

(See Fig. 8)

1) Remove the FB Contact Case Ass'y Setscrews (66001232) × 2, (69216076) × 2 and take off the FB Contact Case Ass'y (1AUB5500).

[Installation Procedure for FB Contact Case Ass'y]

1) Pass the FB Contact portion of the FB Contact Case Ass'y (1AUB5500) through the groove Ⓐ in the Camera Body as shown in Fig. 8 and tighten the FB Contact Case Ass'y Setscrews (66001232) × 2.
2) Set the connector holder portion of the FB Contact Case Ass'y on the Camera Body and tighten the FB Contact Case Ass'y Setscrews (69216076) × 2.

Note :

- Install the FB Contact Case Ass'y with care not to break the Film Back Coupling FPC.

[Note on Installation of Other Parts on Camera Body]

a) As shown in Fig. 9, apply the bond (Loctite #648) to the screws.

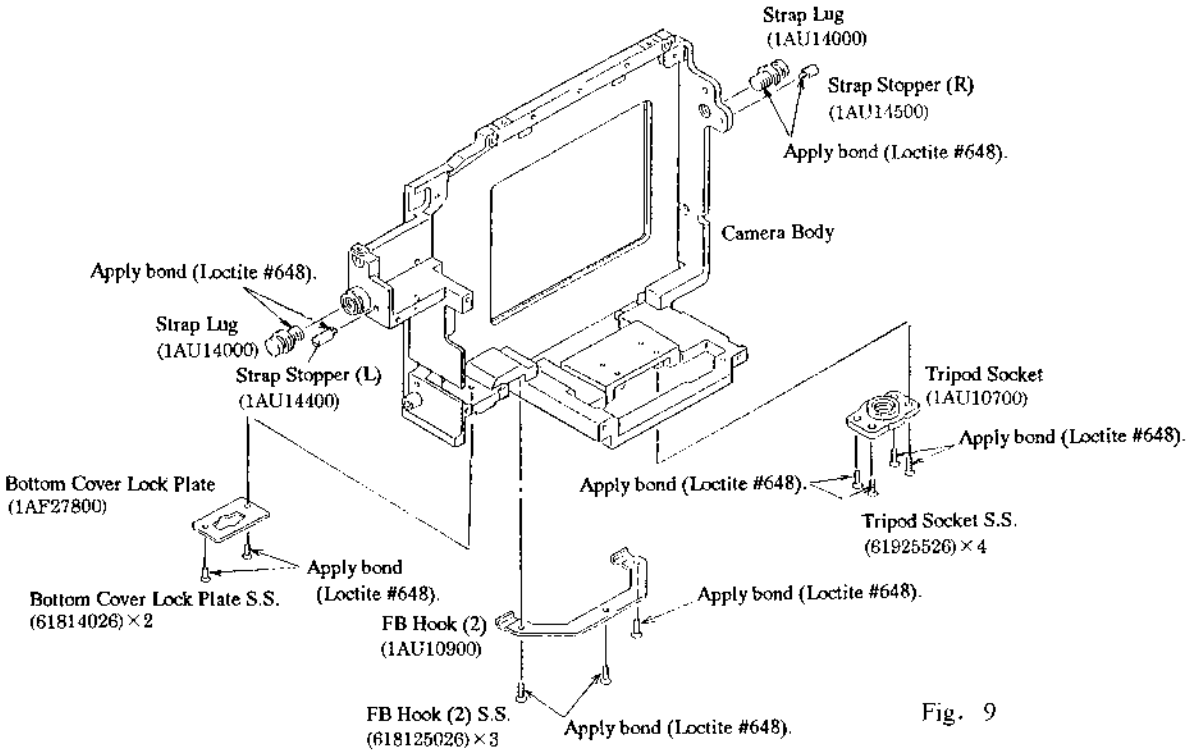


Fig. 9

B-4. DISASSEMBLY OF MOUNT BASE ASS'Y

[Notes on Disassembly of Mount Base Ass'y]

* Observe the following instructions on disassembly of the Mount Base Ass'y :

- Do not remove the AF Module Ass'y from the Mount Base ; removing it will cause faulty auto focusing. If the AF Module Ass'y is defective, replace the Mount Base Ass'y (1AUA10SP) with a new one.
- Do not remove any of the Mirror Base Plates (1) and (2), Main Mirror Horizontal Adjust Plate, Main Mirror 45-degree Adjust Plate and Sub Mirror Adjust Plate which are located at the sides of the Mount Base ; removing any can cause faulty auto focusing or viewfinder focusing. (See Fig. 14)
- This camera employs an FPC Connector to connect an FPC to the R. P.C. Board. To disconnect an FPC from the FPC Connector, as shown in Fig. 11, move the two sliders of the FPC Connector in the direction of the arrow Ⓐ and remove the FPC.
  To set an FPC into the FPC Connector, clean the connecting pattern of the FPC with lens cleaning paper with ether alcohol, insert the connecting pattern of the FPC into the FPC Connector and move the two sliders in the direction of the arrow Ⓑ.

[Chart for Removal of Main FPC Ass'y]

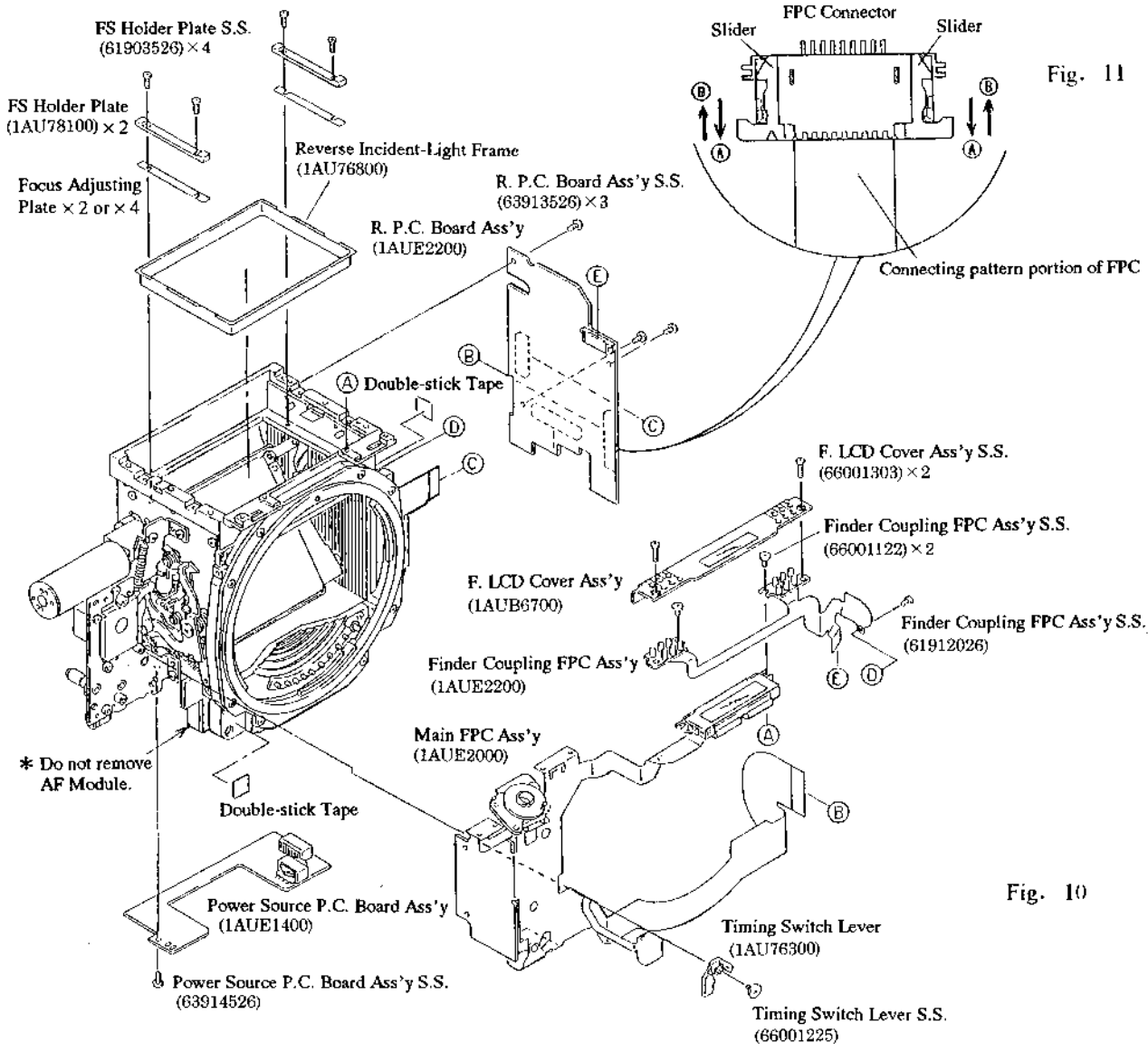


Fig. 10

Fig. 11

B-4-1. Removal of Reverse Incident-Light Frame

(See Fig. 10)

1) Remove the FS Holder Plate Setscrews (61903526) × 4 and take off the FS Holder Plate (1AU78100) × 2 and Focus Adjusting Plate × 2 or × 4.
2) Remove the Reverse Incident-Light Frame (1AU76800).

B-4-2. Removal of Main FPC Ass'y

(See Figs. 10 and 12)

1) Unsolder the Black and Red lead wires (from Motor) on the Main FPC Ass'y.
2) Unsolder the Red and Black lead wires (for Back Light LED) on the R. P.C. Board Ass'y (1AUE2200).
3) Unsolder the Red and Black lead wires (from Plunger) on the Main FPC Ass'y.
4) Unsolder the 2 soldered joints between the Main FPC Ass'y and the Mirror Up Magnet.
5) Disconnect the connecting pattern portion of the Main FPC Ass'y from the FPC Connector on the R. P.C. Board Ass'y.
6) Remove the Timing Switch Lever Setscrew (66001225) and take off the Timing Switch Lever (1AU76300).
7) Remove the F. LCD Cover Ass'y Setscrews (66001303) × 2 and take off the F. LCD Cover Ass'y (1AUB 6700).
8) Remove the Finder Coupling FPC Ass'y Setscrews (66001122) × 2 and take off the Viewfinder LCD portion.
9) Remove the Main FPC Ass'y (1AUE2000).

[Chart for Unsoldering on Main FPC Ass'y]

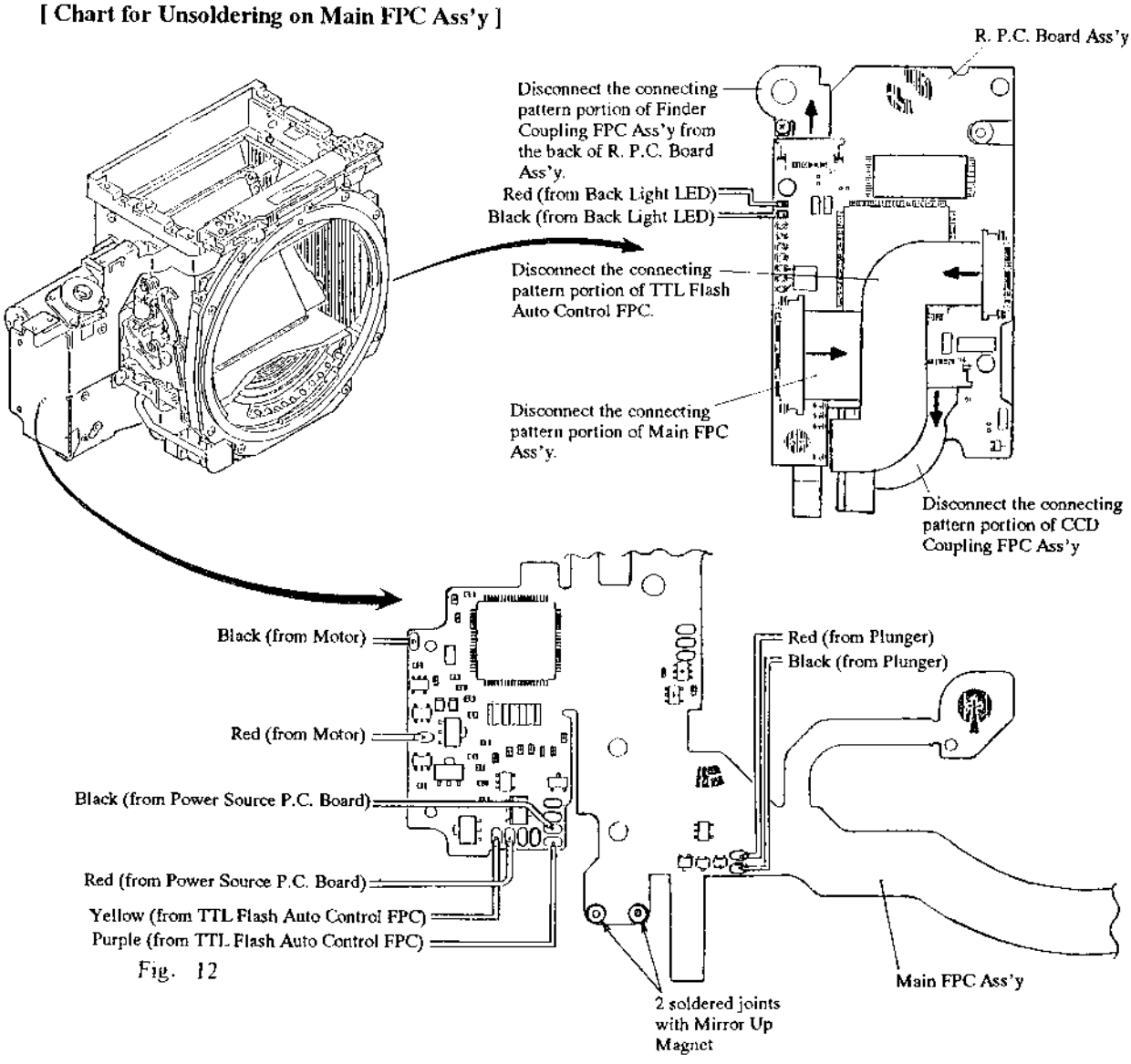

R. P.C. Board Ass'y
Disconnect the connecting pattern portion of Finder Coupling FPC Ass'y from the back of R. P.C. Board Ass'y.
Red (from Back Light LED)
Black (from Back Light LED)
Disconnect the connecting pattern portion of TTL Flash Auto Control FPC.
Disconnect the connecting pattern portion of Main FPC Ass'y.
Disconnect the connecting pattern portion of CCD Coupling FPC Ass'y
Black (from Motor)
Red (from Motor)
Black (from Power Source P.C. Board)
Red (from Power Source P.C. Board)
Yellow (from TTL Flash Auto Control FPC)
Purple (from TTL Flash Auto Control FPC)
Red (from Plunger)
Black (from Plunger)
Main FPC Ass'y
2 soldered joints with Mirror Up Magnet

Fig. 12

No.	419-01-41-RA1AU01

[Chart for Disassembly of Mount Base Ass'y]

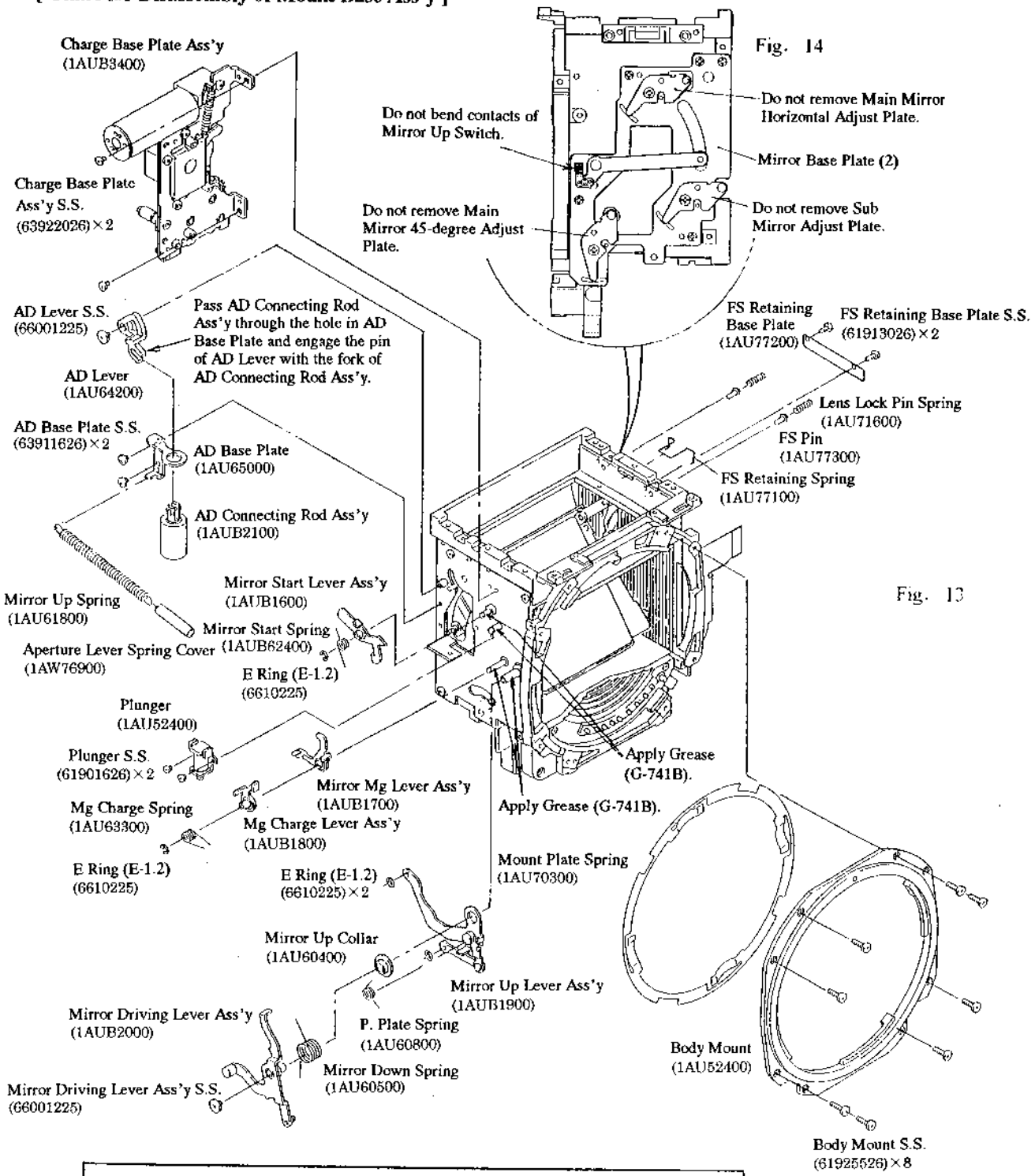

Charge Base Plate Ass'y (1AUB3400)
Charge Base Plate Ass'y S.S. (63922026)×2
AD Lever S.S. (66001225)
Pass AD Connecting Rod Ass'y through the hole in AD Base Plate and engage the pin of AD Lever with the fork of AD Connecting Rod Ass'y.
AD Lever (1AU64200)
AD Base Plate S.S. (63911626)×2
AD Base Plate (1AU65000)
AD Connecting Rod Ass'y (1AUB2100)
Mirror Up Spring (1AU61800)
Aperture Lever Spring Cover (1AW76900)
Mirror Start Lever Ass'y (1AUB1600)
Mirror Start Spring (1AUB62400)
E Ring (E-1.2) (6610225)
Plunger (1AU52400)
Plunger S.S. (61901626)×2
Mg Charge Spring (1AU63300)
E Ring (E-1.2) (6610225)
Mirror Mg Lever Ass'y (1AUB1700)
Mg Charge Lever Ass'y (1AUB1800)
E Ring (E-1.2) (6610225)×2
Mirror Up Collar (1AU60400)
Mirror Driving Lever Ass'y (1AUB2000)
Mirror Driving Lever Ass'y S.S. (66001225)
P. Plate Spring (1AU60800)
Mirror Down Spring (1AU60500)
Mirror Up Lever Ass'y (1AUB1900)
Mount Plate Spring (1AU70300)
Do not bend contacts of Mirror Up Switch.
Do not remove Main Mirror Horizontal Adjust Plate.
Mirror Base Plate (2)
Do not remove Main Mirror 45-degree Adjust Plate.
Do not remove Sub Mirror Adjust Plate.
FS Retaining Base Plate (1AU77200)
FS Retaining Base Plate S.S. (61913026)×2
Lens Lock Pin Spring (1AU71600)
FS Pin (1AU77300)
FS Retaining Spring (1AU77100)
Apply Grease (G-741B).
Apply Grease (G-741B).
Body Mount (1AU52400)
Body Mount S.S. (61925526)×8

Fig. 14

Fig. 13

(Chart for Greasing Points)

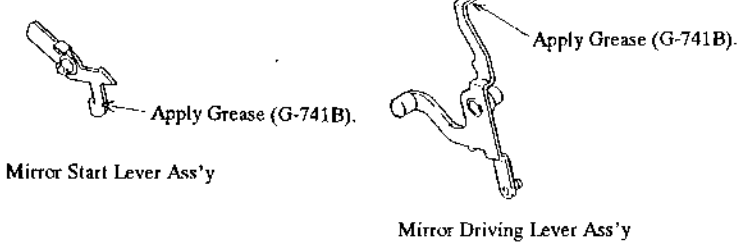


Fig. 15

B-4-3. Removal of Charge Base Plate Ass'y

(See Fig. 12)

1) Remove the Charge Base Plate Ass'y Setscrews (63922026) × 2 and take off the Charge Base Plate Ass'y (1AUB3400).

B-4-4. Removal of P.C. Board Assemblies

(See Figs. 10 and 12)

1) Disconnect the connecting pattern portion of the TTL Flash Auto Control FPC Ass'y from the FPC Connector on the R. P.C. Board Ass'y.
2) Disconnect the connecting pattern portion of the CCD Coupling FPC Ass'y from the FPC Connector on the R. P.C. Board Ass'y.
3) Remove the R. P.C. Board Ass'y Setscrews (63913526) × 3 and take off the R. P.C. Board Ass'y (1AU E2200).
4) Remove the Finder Coupling FPC Ass'y Setscrew (61912026).
5) Disconnect the connecting pattern portion of the Finder Coupling FPC Ass'y from the FPC Connector located on the back of the R. P.C. Board Ass'y and take off the Finder Coupling FPC Ass'y (1AUE2200).

   Notes :

   - Take care, since the Finder Coupling FPC Ass'y is fixed to the Mount Base with double-stick tape.
   - When the R. P.C. Board Ass'y (1AUE2200) has been removed, take care not to bend the contacts of the Mirror Up Switch located at the right side of the Mount Base Ass'y. (See Fig. 14)
6) Remove the Power Source P.C. Board Ass'y Setscrew (63914526) and take off the Power Source P.C. Board Ass'y (1AUE1400).

B-4-5. Removal of Other Parts

(See Fig. 13)

1) Remove the Mirror Up Spring (1AU61800) and take off the Aperture Lever Spring Cover (1AW76900).
2) Remove the AD Base Plate Setscrews (63911626) × 2 and take off the AD Base Plate (1AU65000) and AD Connecting Rod Ass'y (1AUB2100).
3) Remove the AD Lever Setscrew (66001225) and take off the AD Lever (1AU64200).
4) Remove the Mirror Driving Lever Ass'y Setscrew (66001225) and take off the Mirror Driving Lever Ass'y (1AUB2000), Mirror Down Spring (1AU60500), Mirror Up Collar (1AU60400) and P. Plate Spring (1AU6 0800).
5) Remove the E Rings (E-1.2) (66101225) ×2 and take off the Mirror Up Lever Ass'y (1AUB1900).
6) Remove the E Ring (E-1.2) (66101225) and take off the Mg Charge Spring (1AU63300) and Mg Charge Lever Ass'y (1AUB1800).
7) Remove the Plunger Setscrews (61901626) × 2 and take off the Plunger (1AU52400).
8) Remove the E Ring (E-1.2) (66101225) and take off the Mirror Start Spring (1AU62400), Mirror Start Lever Ass'y (1AUB1600) and Mirror Mg Lever Ass'y (1AUB1700).
9) Remove the FS Retaining Base Plate Setscrews (61913026) × 2 and take off the FS Retaining Base Plate (1AU77200), Lens Lock Pin Spring (1AU71600), FS Pin (1AU77300) and FS Retaining Spring (1AU77100).
10) Remove the Body Mount Setscrews (61925526) × 8 and take off the Body Mount (1AU70200) and Mount Plate Spring (1AU70300).

    Note :

    - Do not remove any other parts from the Mount Base Ass'y.

[Notes on Installation of Mechanical Parts of Mount Base Ass'y]

a) Apply Grease (G-741B) to the shafts on the Mirror Base Plate (1) and to specified positions of levers. (See Figs. 13 and 15)
b) When installing mechanical parts of the Mount Base Ass'y, take precautions as instructed in Fig. 16.

[Chart for Installation of Mechanical Parts of Mount Base Ass'y]

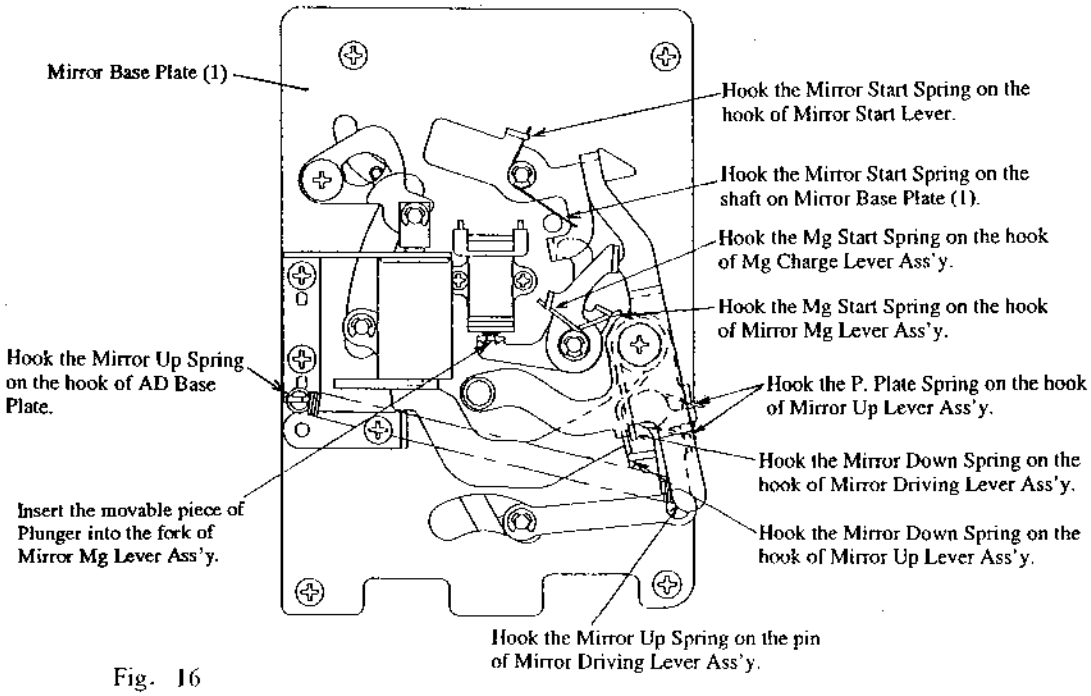

Mirror Base Plate (1)
Hook the Mirror Start Spring on the hook of Mirror Start Lever.
Hook the Mirror Start Spring on the shaft on Mirror Base Plate (1).
Hook the Mg Start Spring on the hook of Mg Charge Lever Ass'y.
Hook the Mg Start Spring on the hook of Mirror Mg Lever Ass'y.
Hook the Mirror Up Spring on the hook of AD Base Plate.
Hook the P. Plate Spring on the hook of Mirror Up Lever Ass'y.
Hook the Mirror Down Spring on the hook of Mirror Driving Lever Ass'y.
Insert the movable piece of Plunger into the fork of Mirror Mg Lever Ass'y.
Hook the Mirror Down Spring on the hook of Mirror Up Lever Ass'y.
Hook the Mirror Up Spring on the pin of Mirror Driving Lever Ass'y.

Fig. 16

B-4-6. Disassembly of Charge Base Plate Ass'y

(See Fig. 17)

1) Remove the M. Charge Spring (1AU75100).
2) Remove the Release Lever Setscrew (66001225) and take off the Release Lever (1AU75300) and Release Lever Spring (1AU75500).
3) Remove the Charge Cam Setscrew (66001225) and take off the Charge Cam (1) (1AU74100).
4) Remove the Charge Cam Setscrew (66001225) and take off the Charge Cam (2) (1AU74300).
5) Remove the Release Mg Lever Ass'y Setscrew (66001225) and take off the Release Mg Spring (1AU75900), Release Mg Lever Ass'y (1AUB3900), Release Charge Spring (1AU76100) and Release Charge Lever (1AU76000).
6) Remove the Plunger Setscrews (61901626) × 2 and take off the Plunger (1AU52400).
7) Remove the Charge Gear Box Setscrews (69214066) × 3 and take off the Charge Gear Box (1AU73600), Charge Gear (3) (1AU73900), Charge Gear (1) (1AU73700), Charge Gear (4) (1AU74000) and Charge Gear (2) (1AU73800).
8) Remove the Motor Setscrews (63913526) × 2 and take off the Motor (1AU52300).

[Notes on Installation of Charge Base Plate Ass'y]

a) Apply Grease (G-741B) to the shafts on the Charge Base Plate and in the Charge Gear Box. (See Fig. 18)
b) Apply Grease (G-741B) to the Charge Cam (1) (1AU74100) and Charge Cam (2) (1AU74300) (see Fig. 18), and install them on the Base Plate so that the marking hole position of the Charge Cam (1) is in alignment with the marking hole position of the Charge Cam (2).
c) Apply Grease (G-741B) to the teeth of the Charge Gear (2) (1AU73800), Charge Gear (4) (1AU74000), Charge Gear (1) (1AU73700) and Charge Gear (3) (1AU73900).
d) After tightening the Motor Setscrews (63913526) × 2, apply the bond (Cemedine 551) to each screw head.

[Chart for Disassembly of Charge Base Plate Ass'y]

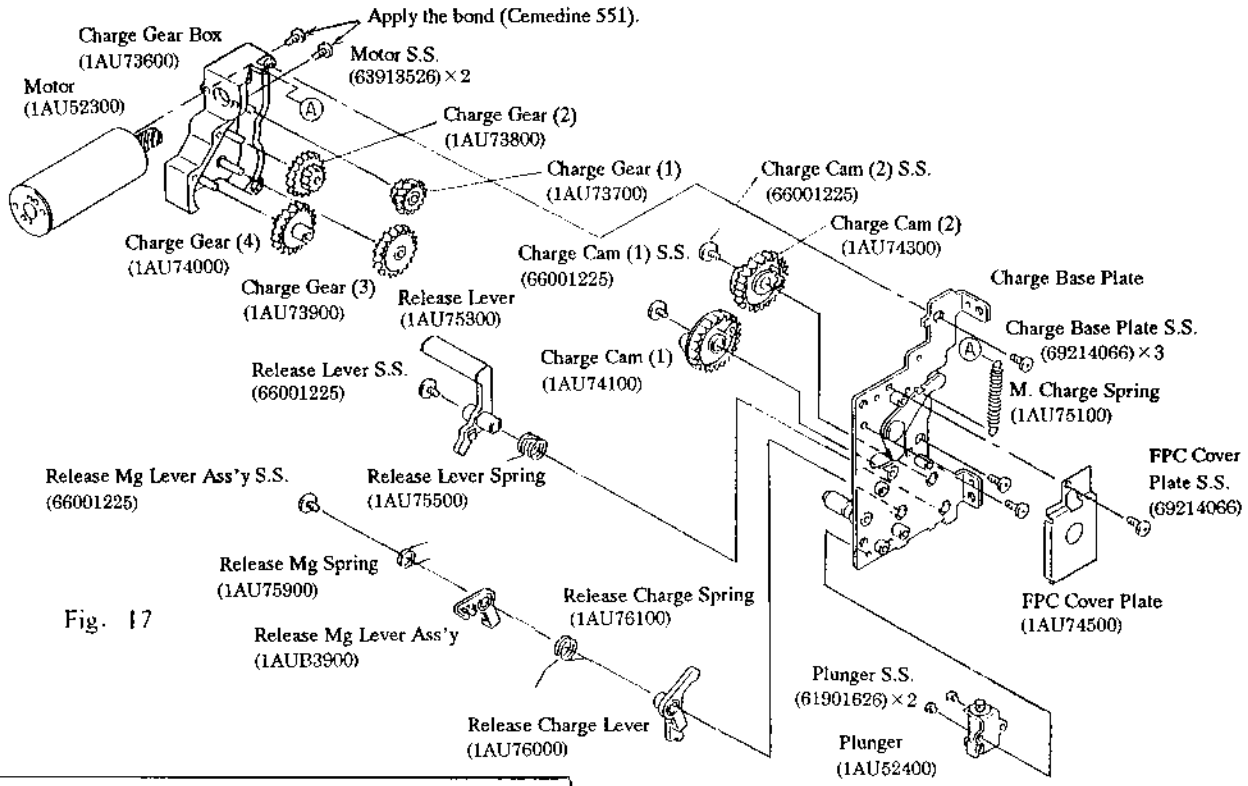

Apply the bond (Cemedine 551).
Charge Gear Box (1AU73600)
Motor S.S. (63913526) × 2
Motor (1AU52300)
Charge Gear (2) (1AU73800)
Charge Gear (1) (1AU73700)
Charge Cam (2) S.S. (66001225)
Charge Gear (4) (1AU74000)
Charge Cam (2) (1AU74300)
Charge Cam (1) S.S. (66001225)
Charge Gear (3) (1AU73900)
Release Lever (1AU75300)
Charge Base Plate
Charge Base Plate S.S. (69214066) × 3
Release Lever S.S. (66001225)
Charge Cam (1) (1AU74100)
M. Charge Spring (1AU75100)
FPC Cover Plate S.S. (69214066)
Release Mg Lever Ass'y S.S. (66001225)
Release Lever Spring (1AU75500)
Release Mg Spring (1AU75900)
Release Charge Spring (1AU76100)
FPC Cover Plate (1AU74500)
Release Mg Lever Ass'y (1AUB3900)
Plunger S.S. (61901626) × 2
Release Charge Lever (1AU76000)
Plunger (1AU52400)

Fig. 17

(Chart for Greasing Points)

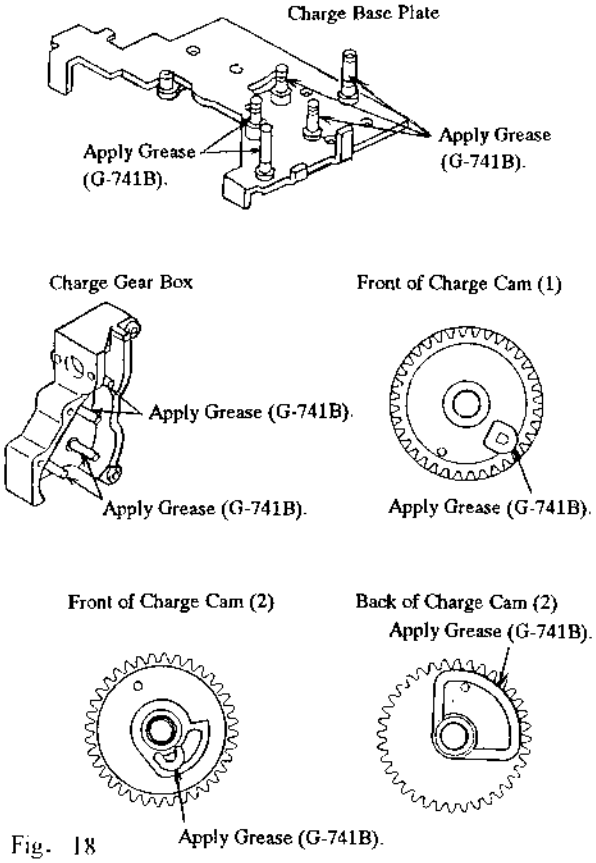


Fig. 18

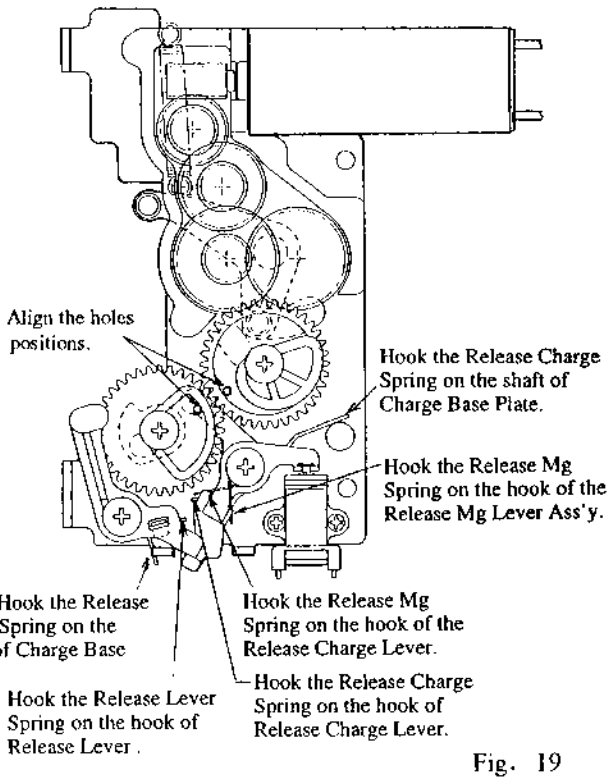

Align the holes positions.
Hook the Release Charge Spring on the shaft of Charge Base Plate.
Hook the Release Mg Spring on the hook of the Release Mg Lever Ass'y.
Hook Hook the Release Lever Spring on the hook of Charge Base Plate.
Hook the Release Mg Spring on the hook of the Release Charge Lever.
Hook the Release Lever Spring on the hook of Release Lever .
Hook the Release Charge Spring on the hook of Release Charge Lever.

Fig. 19

B-5. DRESSING OF LEAD WIRES

B-5-1. Dressing of Lead Wires (on Camera Body)

1) Dress the lead wires on Camera Body in a way as shown in Fig. 20.

[Chart for Dressing of Lead Wires]

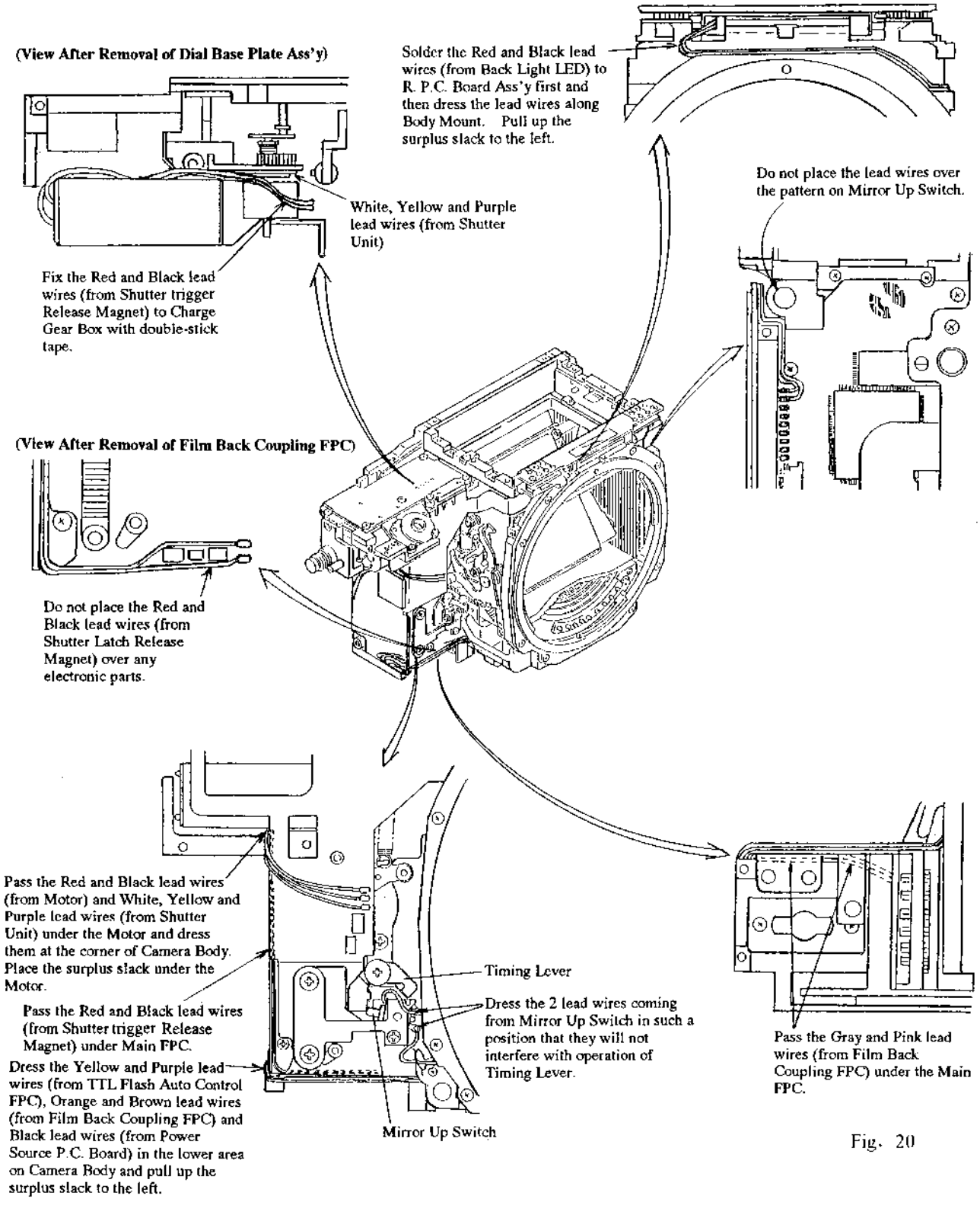

(View After Removal of Dial Base Plate Ass'y)
Solder the Red and Black lead wires (from Back Light LED) to R. P.C. Board Ass'y first and then dress the lead wires along Body Mount. Pull up the surplus slack to the left.
White, Yellow and Purple lead wires (from Shutter Unit)
Fix the Red and Black lead wires (from Shutter trigger Release Magnet) to Charge Gear Box with double-stick tape.
Do not place the lead wires over the pattern on Mirror Up Switch.
(View After Removal of Film Back Coupling FPC)
Do not place the Red and Black lead wires (from Shutter Latch Release Magnet) over any electronic parts.
Pass the Red and Black lead wires (from Motor) and White, Yellow and Purple lead wires (from Shutter Unit) under the Motor and dress them at the corner of Camera Body. Place the surplus slack under the Motor.
Pass the Red and Black lead wires (from Shutter trigger Release Magnet) under Main FPC.
Dress the Yellow and Purple lead wires (from TTL Flash Auto Control FPC), Orange and Brown lead wires (from Film Back Coupling FPC) and Black lead wires (from Power Source P.C. Board) in the lower area on Camera Body and pull up the surplus slack to the left.
Timing Lever
Dress the 2 lead wires coming from Mirror Up Switch in such a position that they will not interfere with operation of Timing Lever.
Mirror Up Switch
Pass the Gray and Pink lead wires (from Film Back Coupling FPC) under the Main FPC.

Fig. 20

B-6. DISASSEMBLY OF EXTERIOR ASS'Y PARTS

B-6-1. Disassembly of Top Cover Ass'y

1) Remove the parts in the numerical order of ① to ⑬ as shown in Fig. 21.

Notes :

- When removing the Shutter Dial or Exp. Compensation Dial, take care not to lose any of the Steel Balls (ϕ 1.5) (66701520) × 4.
- Take care not to bend any of switch contacts.

[Notes on Assembly]

a) Install the Shutter Dial in the position of "1/4000" and the Exp. Compensation Contact Base Ass'y (1AUB 7500) with its contacts in the position as shown in Fig. 2.1.
b) Install the Exp. Compensation Dial in the position of "0" and the Exp. Compensation Contact Base Ass'y (1AUB7500) with its contacts positioned in the direction as shown in Fig. 2.1.
c) Install the Mode Lock Spring (1AU22700) in a way as shown in Fig. 22.
d) Apply Grease (G-741B) to the specified positions.
e) After tightening the Setscrews, secure them by applying the bond (Cemedine 551) to their head.

[Chart for Disassembly of Top Cover Ass'y]

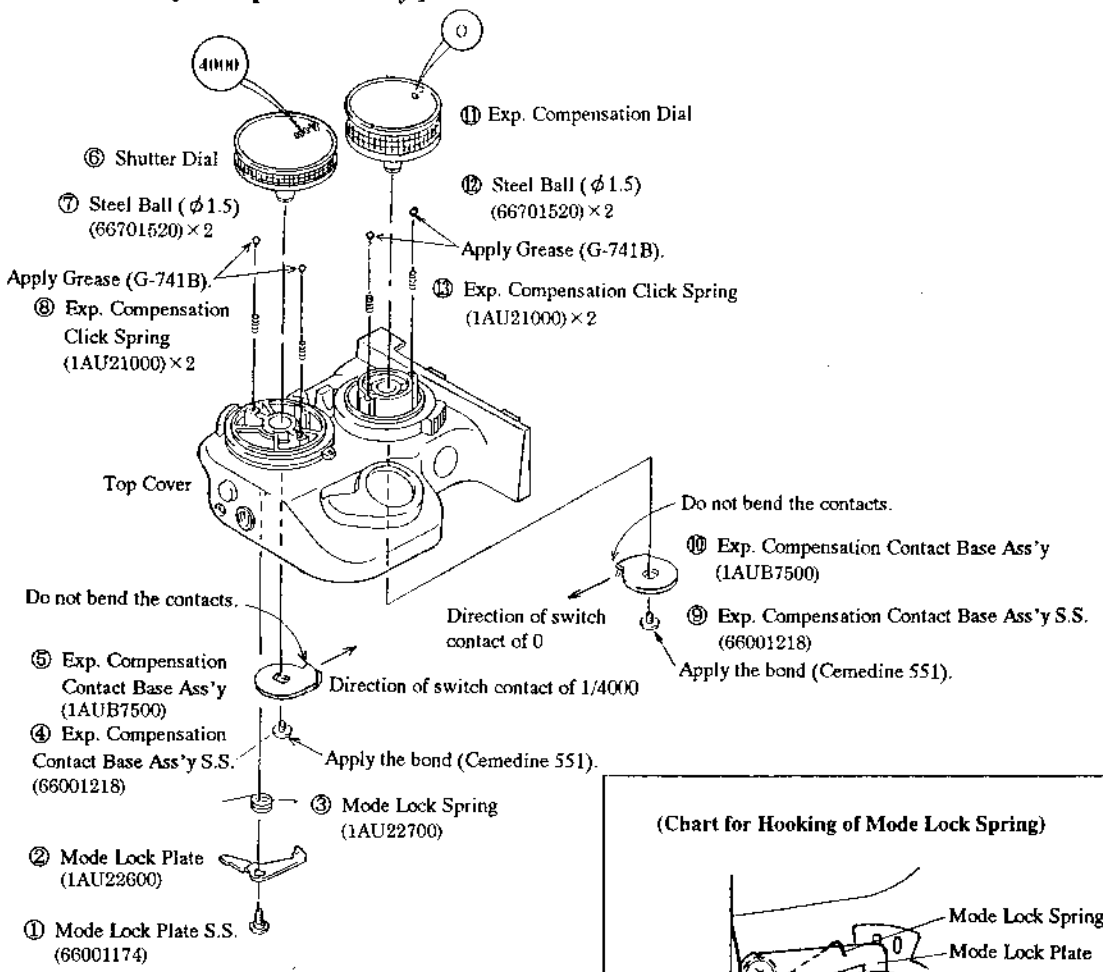

⑪ Exp. Compensation Dial
⑥ Shutter Dial
⑫ Steel Ball (φ1.5) (66701520)×2
⑦ Steel Ball (φ1.5) (66701520)×2
Apply Grease (G-741B).
Apply Grease (G-741B).
⑬ Exp. Compensation Click Spring (1AU21000)×2
⑧ Exp. Compensation Click Spring (1AU21000)×2
Top Cover
Do not bend the contacts.
⑩ Exp. Compensation Contact Base Ass'y (1AUB7500)
Direction of switch contact of 0
⑨ Exp. Compensation Contact Base Ass'y S.S. (66001218)
Apply the bond (Cemedine 551).
Do not bend the contacts.
⑤ Exp. Compensation Contact Base Ass'y (1AUB7500)
Direction of switch contact of 1/4000
④ Exp. Compensation Contact Base Ass'y S.S. (66001218)
Apply the bond (Cemedine 551).
③ Mode Lock Spring (1AU22700)
② Mode Lock Plate (1AU22600)
① Mode Lock Plate S.S. (66001174)

Fig. 21

(Chart for Hooking of Mode Lock Spring)

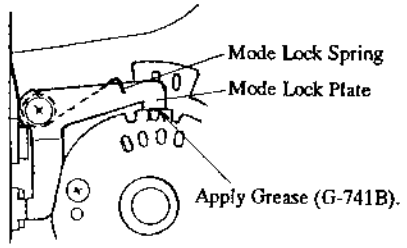


Fig. 22

2) Remove the parts in the numerical order of ① to ⑰ as shown in Fig. 23.

Notes :

- When removing the Mode Click Ass'y (1AUB7700), PF Lever Ass'y (1AUB7600) and Main Switch Click (1AU23800), take care not to lose any of the Steel Balls (ϕ 1.5) (66701520) × 3.
- Take care not to bend any of switch contacts.

[Notes on Reassembly of Top Cover Ass'y]

a) Install the Main Switch Click (1AU23800) with its burr side down.
b) Apply Grease (G-741B) to the three holes for Steel Balls inside the Top Cover and to the specified positions.
c) After tightening the Setscrews, secure them by applying the bond (Cemedine 551) to their head.

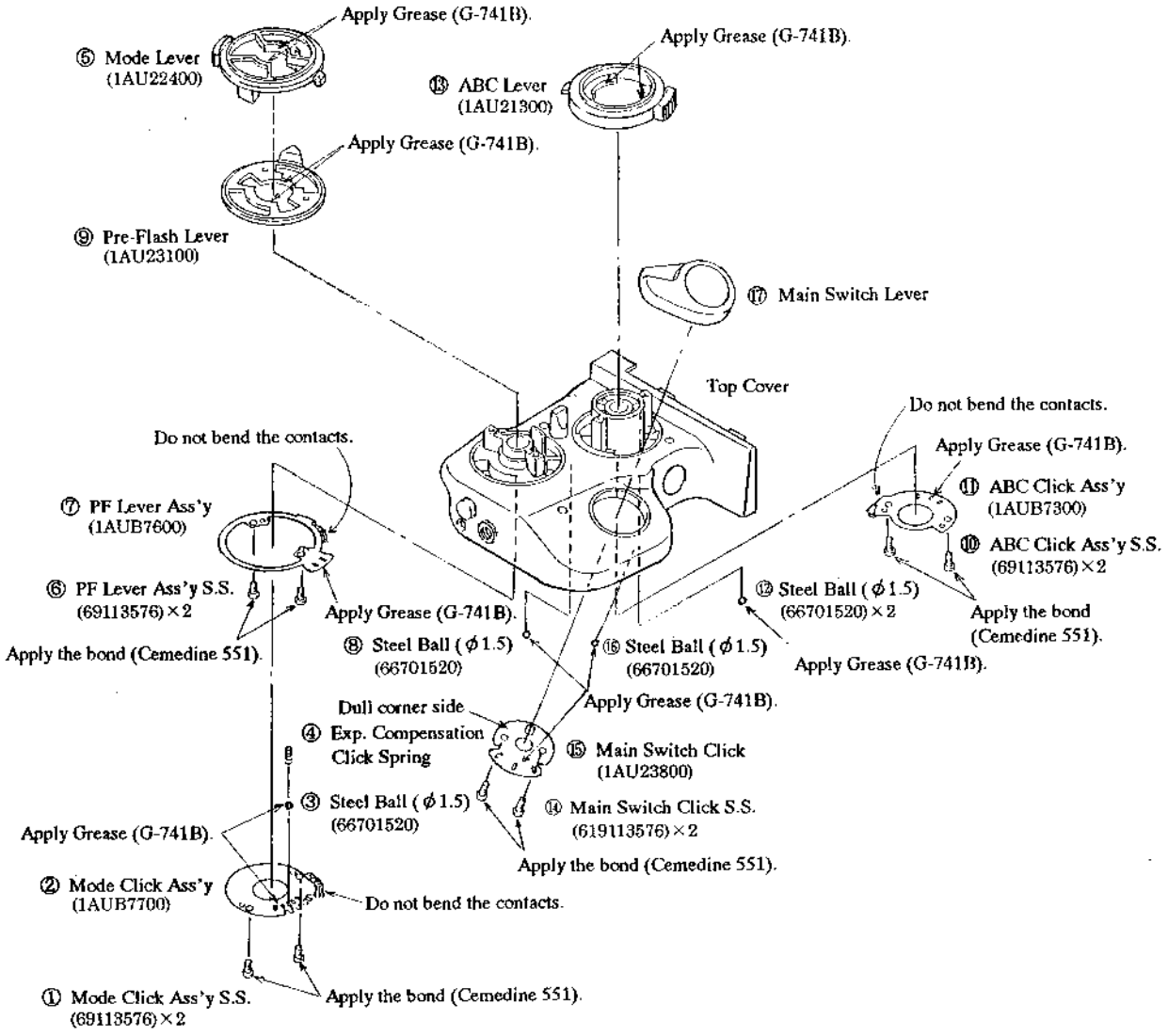

Apply Grease (G-741B).
⑤ Mode Lever (1AU22400)
Apply Grease (G-741B).
⑬ ABC Lever (1AU21300)
Apply Grease (G-741B).
⑨ Pre-Flash Lever (1AU23100)
⑰ Main Switch Lever
Top Cover
Do not bend the contacts.
Apply Grease (G-741B).
⑪ ABC Click Ass'y (1AUB7300)
⑩ ABC Click Ass'y S.S. (69113576)×2
Do not bend the contacts.
⑦ PF Lever Ass'y (1AUB7600)
⑥ PF Lever Ass'y S.S. (69113576)×2
Apply the bond (Cemedine 551).
Apply Grease (G-741B).
⑧ Steel Ball (ϕ 1.5) (66701520)
⑫ Steel Ball (ϕ 1.5) (66701520)×2
Apply the bond (Cemedine 551).
⑯ Steel Ball (ϕ 1.5) (66701520)
Apply Grease (G-741B).
Apply Grease (G-741B).
Dull corner side
④ Exp. Compensation Click Spring
⑮ Main Switch Click (1AU23800)
③ Steel Ball (ϕ 1.5) (66701520)
⑭ Main Switch Click S.S. (619113576)×2
Apply Grease (G-741B).
Apply the bond (Cemedine 551).
② Mode Click Ass'y (1AUB7700)
Do not bend the contacts.
① Mode Click Ass'y S.S. (69113576)×2
Apply the bond (Cemedine 551).

Fig. 23

[Reassembly Procedure for Shutter Dial]

1) Set the Shutter Dial Name Plate (1AU24700) on the Shutter Dial (1AU21800) by fitting the concave portion of the Shutter Dial Name Plate on the boss of the Shutter Dial.
2) Set the Shutter Dial Click (1AU22000) and tighten the Shutter Dial Click Setscrews (69103026) × 2.
   Note :
   - Set the Shutter Dial Click (1AU22000) with its dull side down.
3) Put the Shutter Dial Cover (1AU21900) on the Shutter Dial (1AU21800).
4) Apply Grease (G-741B) to the Shutter Dial Click (1AU22000).

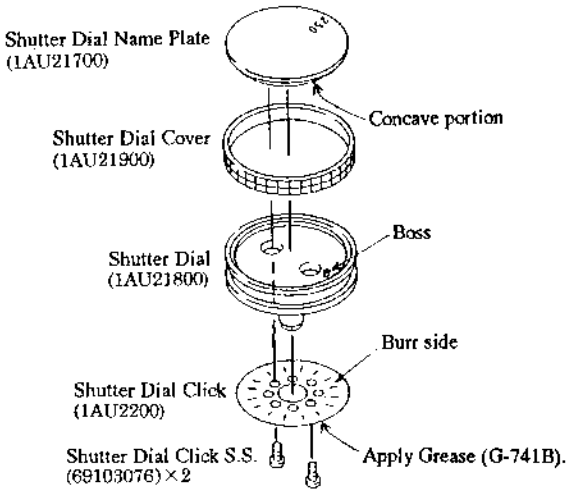


Fig. 24

[Reassembly Procedure for Exp. Compensation Dial]

1) Set the Exp. Compensation Dial Name Plate (1AU20600) on the Exp. Compensation Dial (1AU20700) by fitting the concave portion of the Exp. Compensation Dial Name Plate on the boss of the Exp. Compensation Dial.
2) Set the Exp. Compensation Dial Click (1AU2 0800) on the Exp. Compensation Dial Click (1AU20700) by fitting the concave portion of the Exp. Compensation Dial Click on the convex portion of the Exp. Compensation Dial Click. Then tighten the Exp. Compensation Dial Click Setscrews (69103076) × 2.
   Note :
   - Set the Exp. Compensation Dial Click (1AU2 0800) with its dull side down.
3) Put the ASA Dial Cover (14126100) on the Exp. Compensation Dial (1AU20700).
4) Apply Grease (G-741B) to the Exp. Compensation Dial Click (1AU20800).

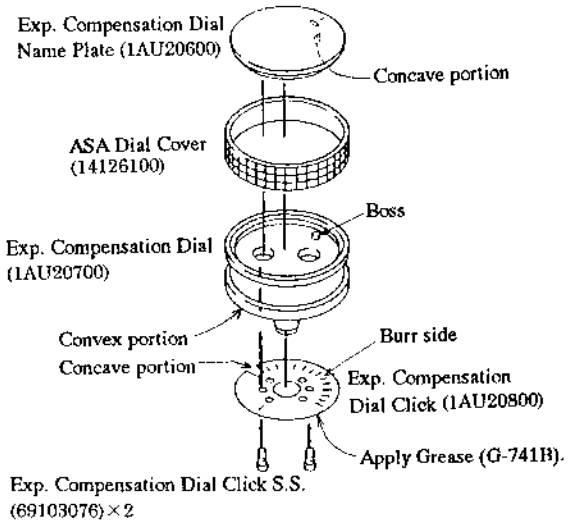


Fig. 25

B-6-2. Disassembly of Rear Cover Ass'y

1) Remove the parts in the numerical order of ① to ⑦ as shown in Fig. 26.

Notes :

- When removing the AF Change Click Plate Ass'y (1AUB6100), take care not to lose any of the Steel Balls (ϕ 1.5) (66701520).
- Take care not to bend the switch contacts of the AF Change Click Plate Ass'y.

[Notes on Reassembly of Rear Cover Ass'y]

a) Wipe the pattern of the Focus FPC Ass'y (1AUE 2300) and the switch contents of the AF Change Click Plate Ass'y.
b) Apply Grease (G-741B) to the specified positions.
c) After tightening the AF Change Click Plate Ass'y Setscrews (69112276) × 2, secure them by applying the bond (Cemedine 551) to their head.

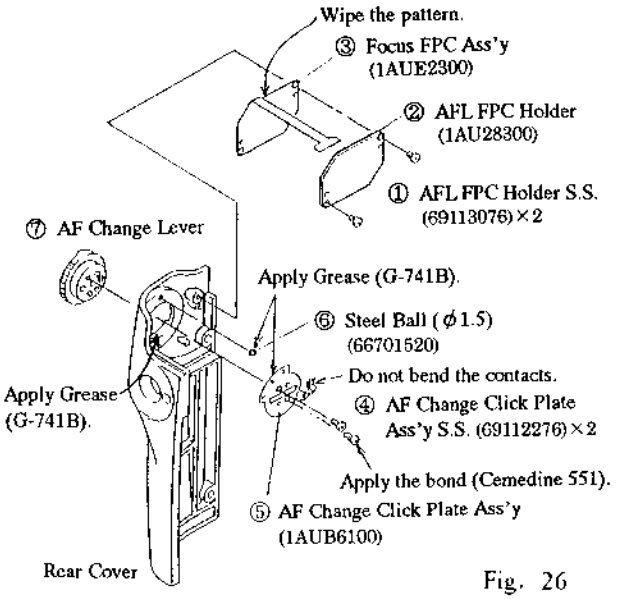

Wipe the pattern.
③ Focus FPC Ass'y (1AUE2300)
② AFL FPC Holder (1AU28300)
① AFL FPC Holder S.S. (69113076)×2
⑦ AF Change Lever
Apply Grease (G-741B).
⑥ Steel Ball (φ1.5) (66701520)
Do not bend the contacts.
Apply Grease (G-741B).
④ AF Change Click Plate Ass'y S.S. (69112276)×2
Apply the bond (Cemedine 551).
⑤ AF Change Click Plate Ass'y (1AUB6100)
Rear Cover

Fig. 26

B-6-3. Disassembly of Side Cover Ass'y

1) Unsolder the 6 soldered joints, including those of the Green lead wire, on the Flash Socket Coupling FPC (1AU51900) and remove the Flash Socket Coupling FPC.
2) Remove the parts in the numerical order of ① to ⑩ as shown in Fig. 27.

Notes :

- When removing the Drive Click (1AU25700), take care not to lose the Steel Ball (ϕ 1.5) (66701520).
- Take care not to bend the Drive Contact (1AU25800).

[Notes on Reassembly of Side Cover Ass'y]

a) Apply Grease (G-741B) to the specified positions.
b) After tightening the Drive Click Setscrew (66001126), secure it by applying the bond (Cemedine 551) to its head.

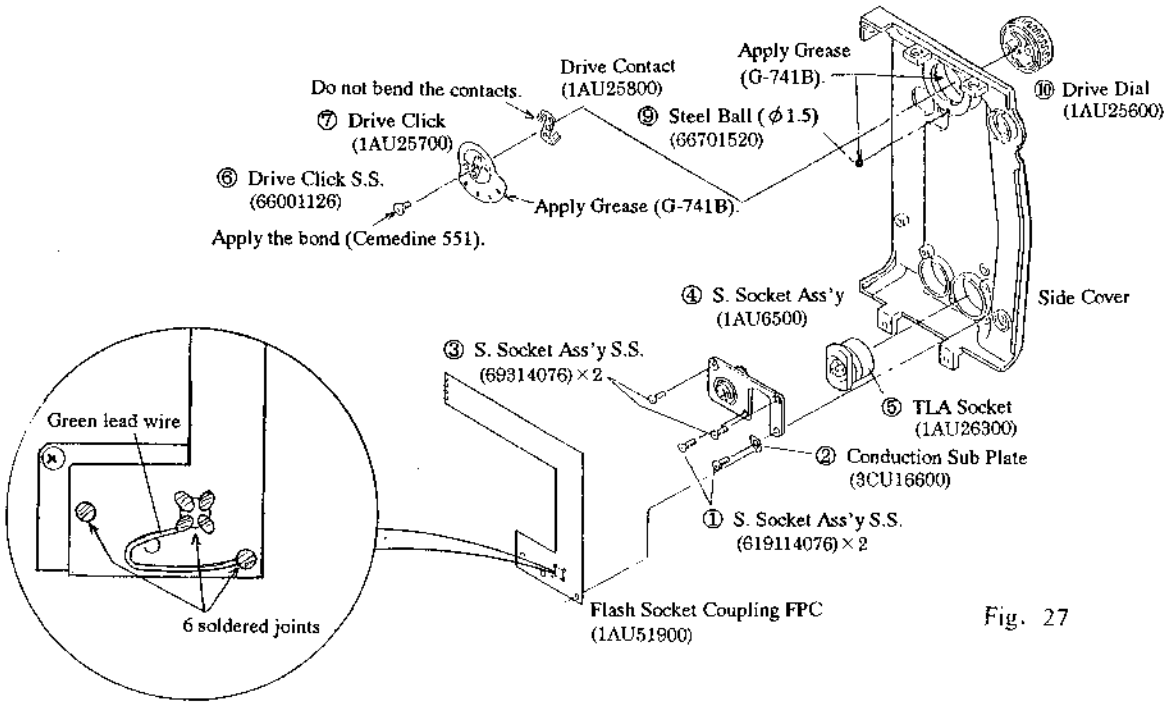

Apply Grease (G-741B).
Drive Contact (1AU25800)
Do not bend the contacts.
⑩ Drive Dial (1AU25600)
⑦ Drive Click (1AU25700)
⑨ Steel Ball (φ1.5) (66701520)
⑥ Drive Click S.S. (66001126)
Apply Grease (G-741B).
Apply the bond (Cemedine 551).
④ S. Socket Ass'y (1AU6500)
Side Cover
③ S. Socket Ass'y S.S. (69314076)×2
⑤ TLA Socket (1AU26300)
② Conduction Sub Plate (3CU16600)
① S. Socket Ass'y S.S. (619114076)×2
Green lead wire
6 soldered joints
Flash Socket Coupling FPC (1AU51900)

Fig. 27

B-6-4. Disassembly of Grip Ass'y

[Chart for Disassembly of Grip Ass'y]

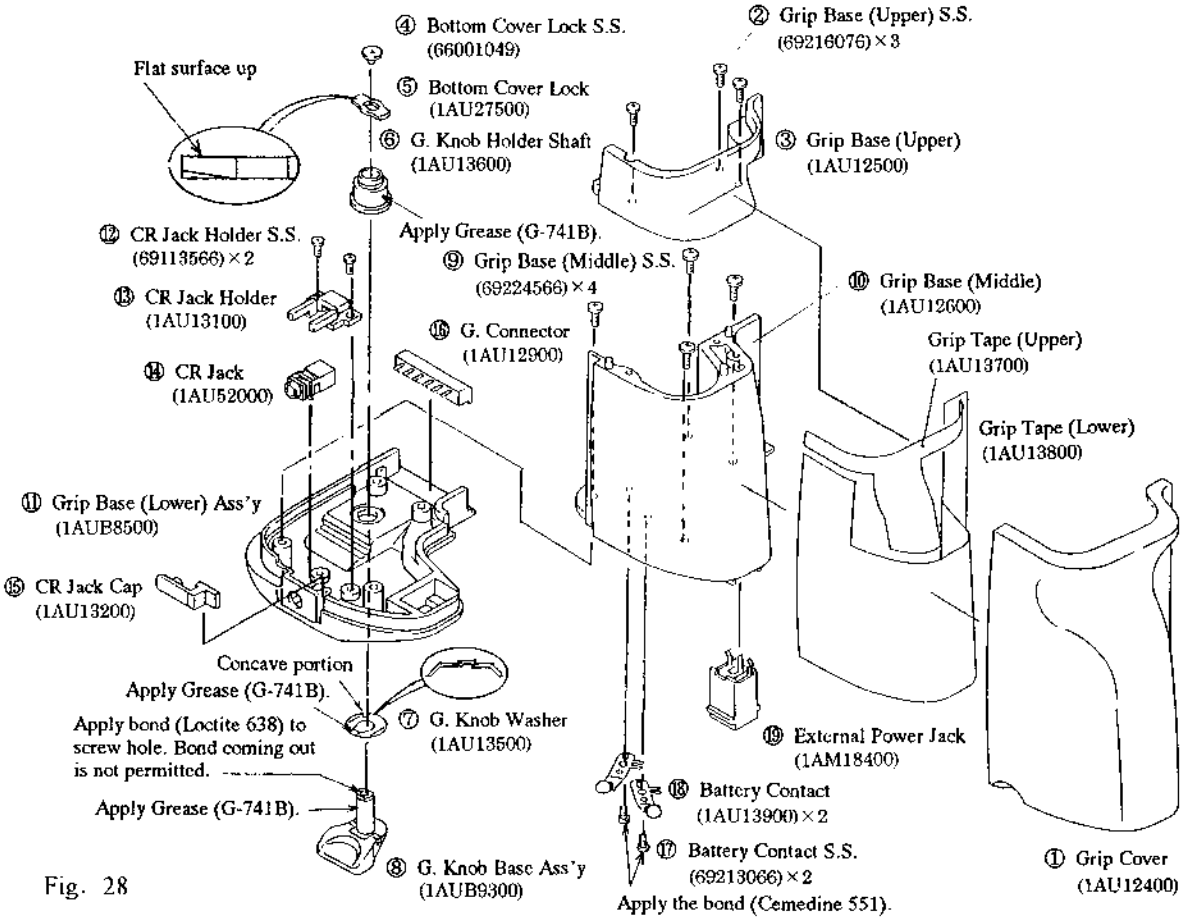

④ Bottom Cover Lock S.S. (66001049)
② Grip Base (Upper) S.S. (69216076)×3
Flat surface up
⑤ Bottom Cover Lock (1AU27500)
⑥ G. Knob Holder Shaft (1AU13600)
③ Grip Base (Upper) (1AU12500)
Apply Grease (G-741B).
⑫ CR Jack Holder S.S. (69113566)×2
⑨ Grip Base (Middle) S.S. (69224566)×4
⑩ Grip Base (Middle) (1AU12600)
⑬ CR Jack Holder (1AU13100)
⑯ G. Connector (1AU12900)
Grip Tape (Upper) (1AU13700)
⑭ CR Jack (1AU52000)
Grip Tape (Lower) (1AU13800)
⑪ Grip Base (Lower) Ass'y (1AUB8500)
⑮ CR Jack Cap (1AU13200)
Concave portion
Apply Grease (G-741B).
Apply bond (Loctite 638) to screw hole. Bond coming out is not permitted.
⑦ G. Knob Washer (1AU13500)
⑲ External Power Jack (1AM18400)
Apply Grease (G-741B).
⑱ Battery Contact (1AU13900)×2
⑰ Battery Contact S.S. (69213066)×2
① Grip Cover (1AU12400)
⑧ G. Knob Base Ass'y (1AUB9300)
Apply the bond (Cemedine 551).

Fig. 28

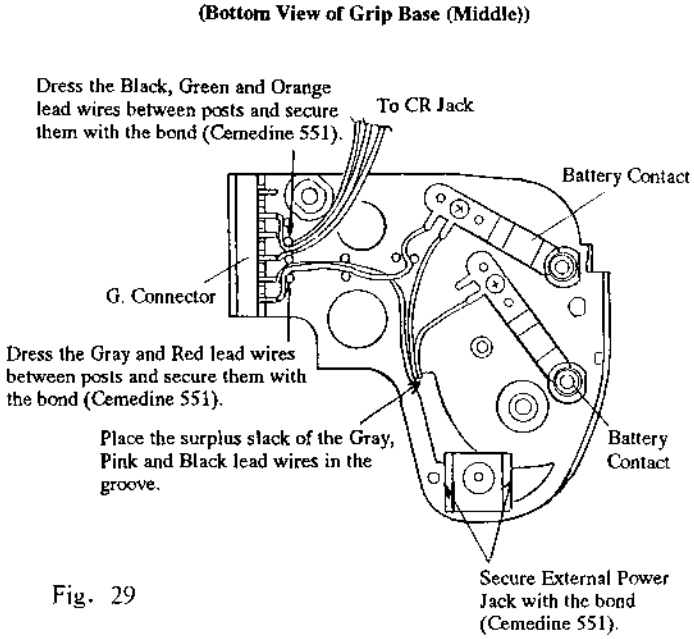

(Bottom View of Grip Base (Middle))
Dress the Black, Green and Orange lead wires between posts and secure them with the bond (Cemedine 551).
To CR Jack
Battery Contact
G. Connector
Dress the Gray and Red lead wires between posts and secure them with the bond (Cemedine 551).
Place the surplus slack of the Gray, Pink and Black lead wires in the groove.
Battery Contact
Secure External Power Jack with the bond (Cemedine 551).

Fig. 29

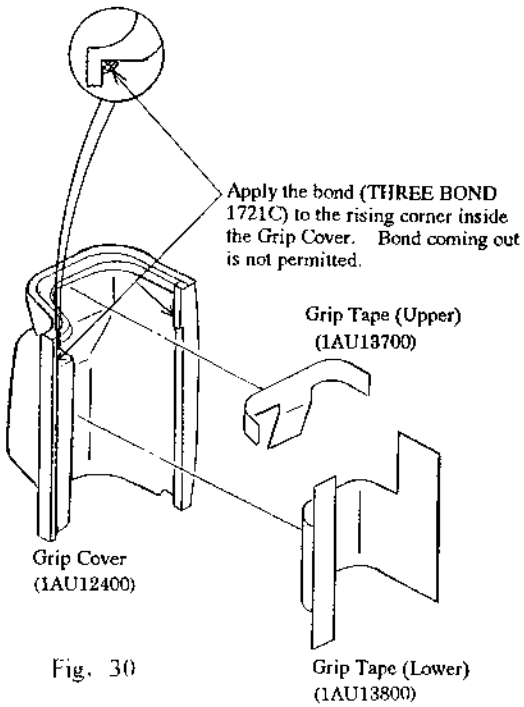

Apply the bond (THREE BOND 1721C) to the rising corner inside the Grip Cover. Bond coming out is not permitted.
Grip Tape (Upper) (1AU13700)
Grip Cover (1AU12400)
Grip Tape (Lower) (1AU13800)

Fig. 30

1) Remove the parts in the numerical order of ① to ⑰ as shown in Fig. 28.
   Notes :
   - Take care, since the Grip Cover (1AU12400) is fixed to the Grip Base with the Grip Tape (Upper) (1AU13700) and Grip Tape (Lower) (1AU13800).
     Once the Grip Cover has been peeled off, the adhesive strength of the Grip Tape (Upper) and Grip Tape (Lower) weakens. Be sure to replace the Grip Tape (Upper) and Grip Tape (Lower) with new ones.
   - Take care, since the External Power Jack (1AM18400) is fixed to the Grip Base (Middle) (1AU12600) with the bond (Cemedine 551).
   - Remove the G. Connector (1AU12900), CR Jack (1AU52900), External Power Jack (1AM18400) and Battery Contact (1AU13900) together with the lead wires, as shown in Fig. 31.

[Notes on Reassembly of Grip Ass'y]

a) Set the G. Knob Washer (1AU13500) in an orientation as shown in Fig. 28 with care not to confuse the top and bottom and fit the concave portion of the G. Knob Washer on the boss of the G. Knob Base Ass'y (1AUB 8300).
b) Install the Bottom Cover Lock (1AF27500) with its flat surface up, as shown in Fig. 28.
c) Stick the Grip Tape (Upper) (1AU13700) and Grip Tape (Lower) (1AU13800) on the Grip Cover in a way as shown in Fig. 29. Then affix the Grip Cover to the Grip Base and secure the Grip Cover by applying the bond (THREE BOND 1721C) to the inside of both sides of the Grip Cover.
d) Dress the lead wires between the posts and secure them with the bond (Cemedine 551).

[Wiring Diagram for Grip Ass'y]

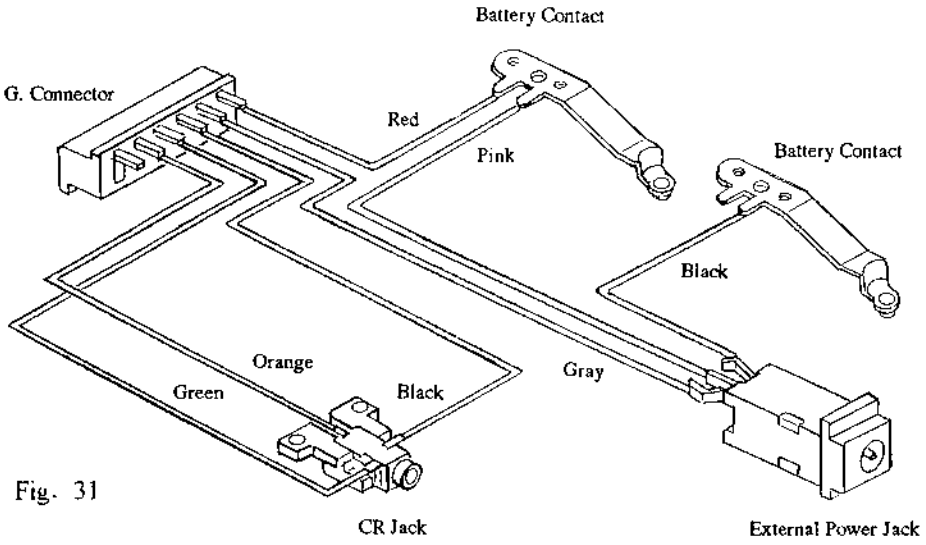


Fig. 31

B-7. DISASSEMBLY OF FILM BACK ASS'Y

[Chart for Removal of Exterior Parts of Film Back Ass'y]

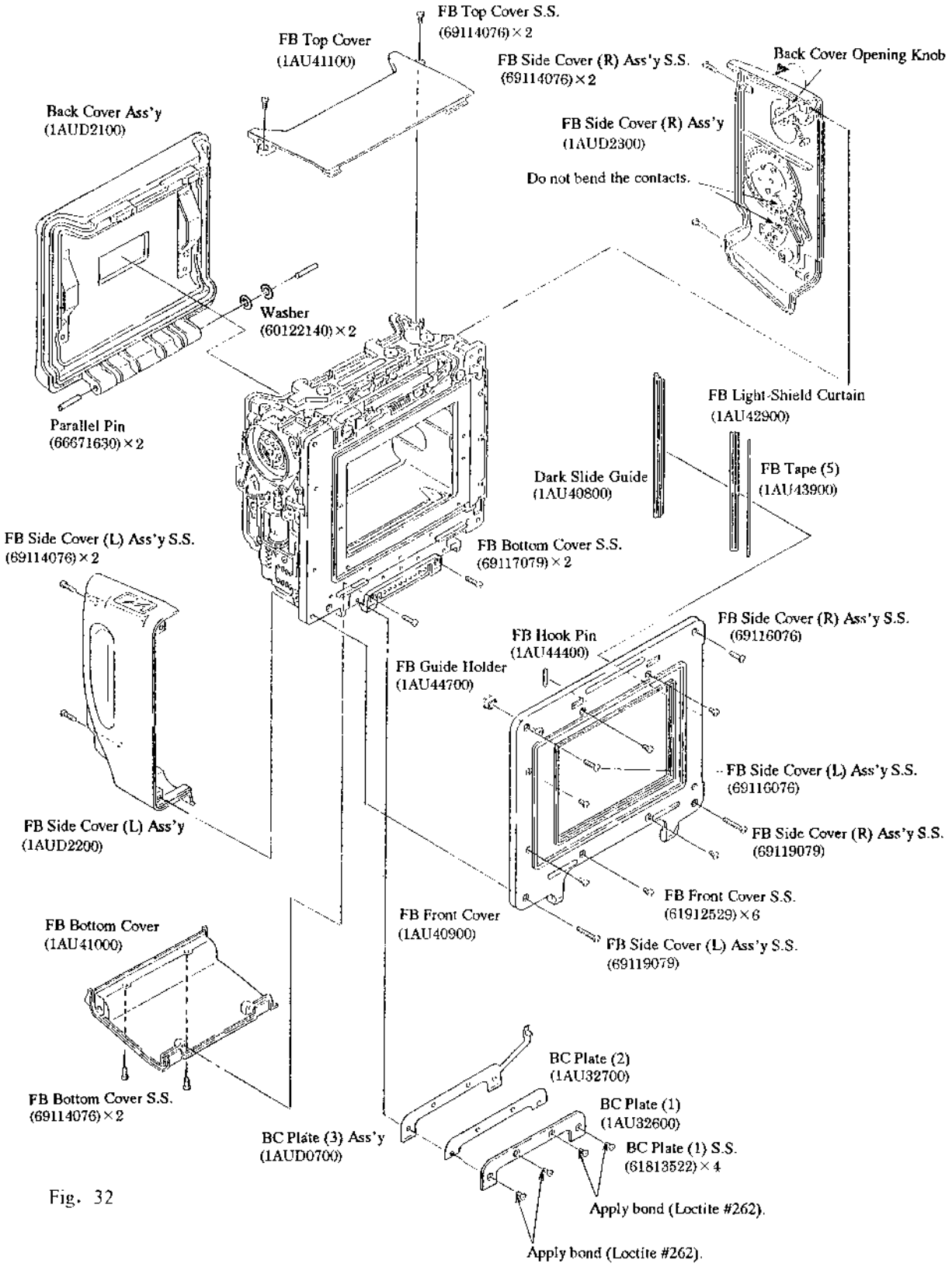


Fig. 32

B-7-1. Removal of Exterior Parts of Film Back Ass'y

(See Fig. 33)

1) While pushing the pin of the BC Plate (2) Ass'y with tweezers or the like, pull out the Dark Slide (1AU40100). (See Fig. 32)
2) Remove the FB Side Cover (R) Ass'y Setscrews (69119079), (69116079).
3) Raise the Back Cover Opening Knob, turn it in the direction of the arrow and open the Back Cover.
4) Remove the FB Side Cover (R) Ass'y Setscrews (69114076) × 2 and take off the FB Side Cover (R) Ass'y (1AUD2300).

   Note :

   - When the FB Side Cover (R) Ass'y (1AUD2300) has been removed, take care not to bend the ISO brush contact or the multiple exposure contact mounted on the FB Side Cover (R) Ass'y.
5) Remove the FB Side Cover (L) Ass'y Setscrews (69119079), (69116079).
6) Raise the Back Cover Opening Knob, turn it in the direction of the arrow and open the Back Cover.
7) Remove the FB Side Cover (L) Ass'y Setscrews (69115076) × 2 and take off the FB Side Cover (L) Ass'y (1AUD2200).
8) Remove the FB Top Cover Setscrews (69114076) × 2 and take off the FB Top Cover (1AU41100).
9) Remove the Parallel Pins (66671630) × 2 and take off the Back Cover Ass'y (1AUD2100) and Washers (6012 2140) × 2.

   Note :

   - Take care not to lose any of the Parallel Pins (66671630) × 2 and Washers (60122140) × 2.
10) Remove the FB Bottom Cover Setscrews (69117079) × 2, (69114076) × 2 and take off the FB Bottom Cover (1AU41000).
11) Remove the FB Front Cover Setscrews (61912529) × 6 and take off the FB Front Cover (1AU40900) and Dark Slide Guide (1AU40800).

    Notes :

    - The FB Hook Pin (1AU44400) and FB Guide Holder (1AU44700) are fixed to the FB Front Cover with the bond (THREE BOND 1521B). It is not normally necessary to remove.
    - The FB Light-Shield Curtain (1AU42900) is fixed to the FB Front Cover with the FB Tape (5) (1AU4 3900). It is not normally necessary to remove.
12) Remove the BC Plate (1) Setscrews (61813522) × 4 and take off the BC Plate (1) (1AU32600), BC Plate (2) (1AU32700) and BC Plate (1) Ass'y (1AUD0700).

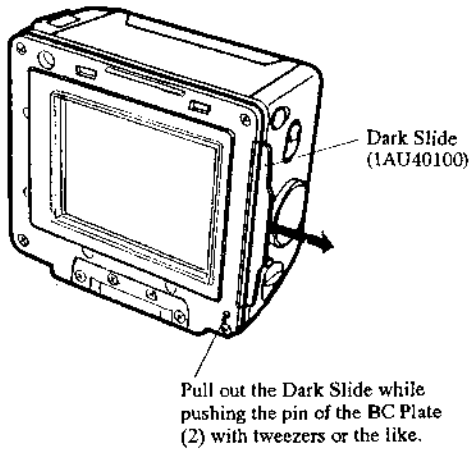


Fig. 33

B-7-2. Removal of FB Main FPC Ass'y

(Bottom of Film Back Ass'y)

1) Remove the Winding Motor Setscrews (63914526) × 2 and take off the Winding Motor (1AU52300).
2) Unsolder the Red and Black lead wires (from Winding Motor) on the FB Main FPC Ass'y (1AUCE300).
3) Unsolder the Black lead wire (from Film Insert Contact SPL).

(Left Side of Film Back Ass'y)

4) Unsolder the 6 soldered joints between the FB Main FPC Ass'y and the FB PC-FPC Ass'y (1AUCE100).
5) Unsolder the Black lead wire (from Conduction Sub Plate).
6) Unsolder the 5 soldered joints between the FB Main FPC Ass'y and the FB Switch FPC (1AU53200).
7) Unsolder the 2 coil wires of the Solenoid Plunger.

[Chart for Unsoldering on FB Main FPC Ass'y]

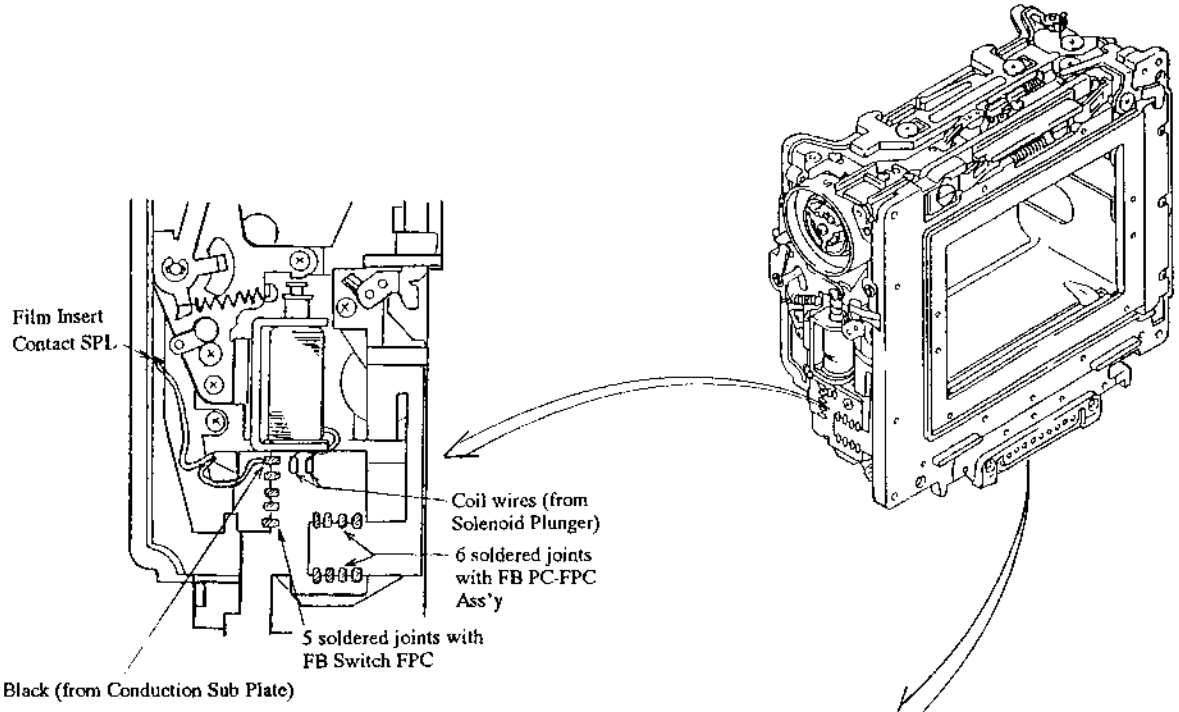
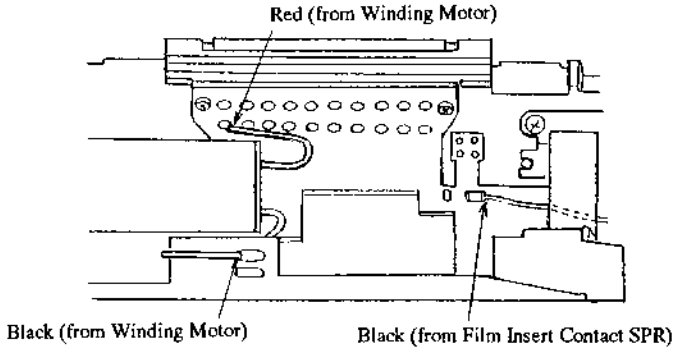

Film Insert Contact SPL
Coil wires (from Solenoid Plunger)
6 soldered joints with FB PC-FPC Ass'y
5 soldered joints with FB Switch FPC
Black (from Conduction Sub Plate)

Fig. 34



8) Remove the DM Retaining Plate Setscrews (69112566) × 2.
9) Remove the PR Retaining Plate Setscrew (69212276) and take off the PR Retaining Plate (1AU33600).
10) Remove the FB Main FPC Ass'y Setscrews (61912022), (61911226) and take off the FB Main FPC Ass'y (1AUCE300).

Notes :

- Take care, since the right area of the FB Main FPC Ass'y are fixed with double-stick tape.
- Once the FB Main FPC Ass'y has been replaced with a new one, adjust the level of the Photo-reflector for bar code by means of the Variable Resistor (VR601).
  For adjustment procedure, follow the Photo-reflector Adjusting Jig.

11) Peel off the double-stick tape and remove the Film Insert Contact SPR (1AU49900).

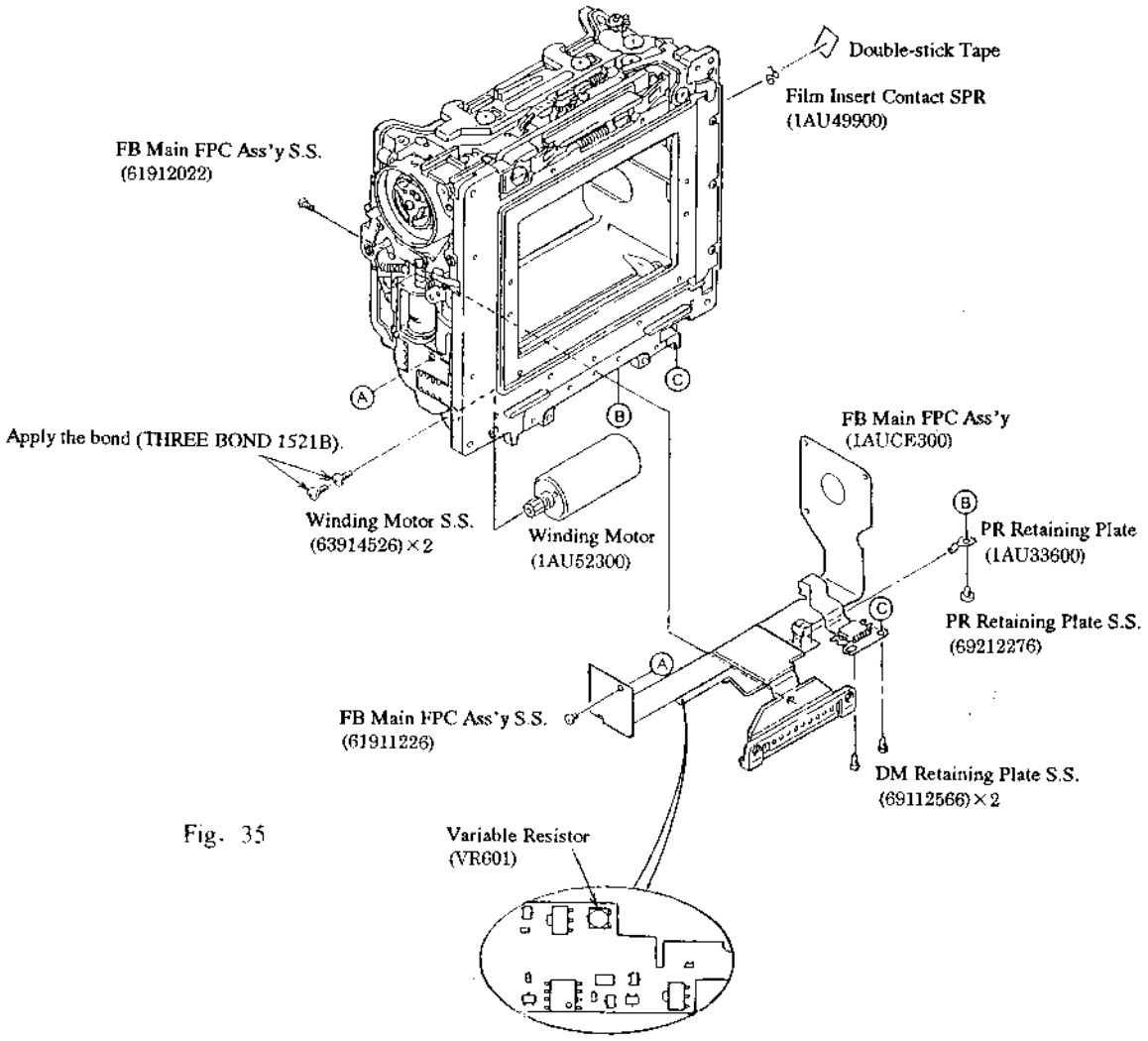


Fig. 35

{ Chart for Removal of Rail Plate }

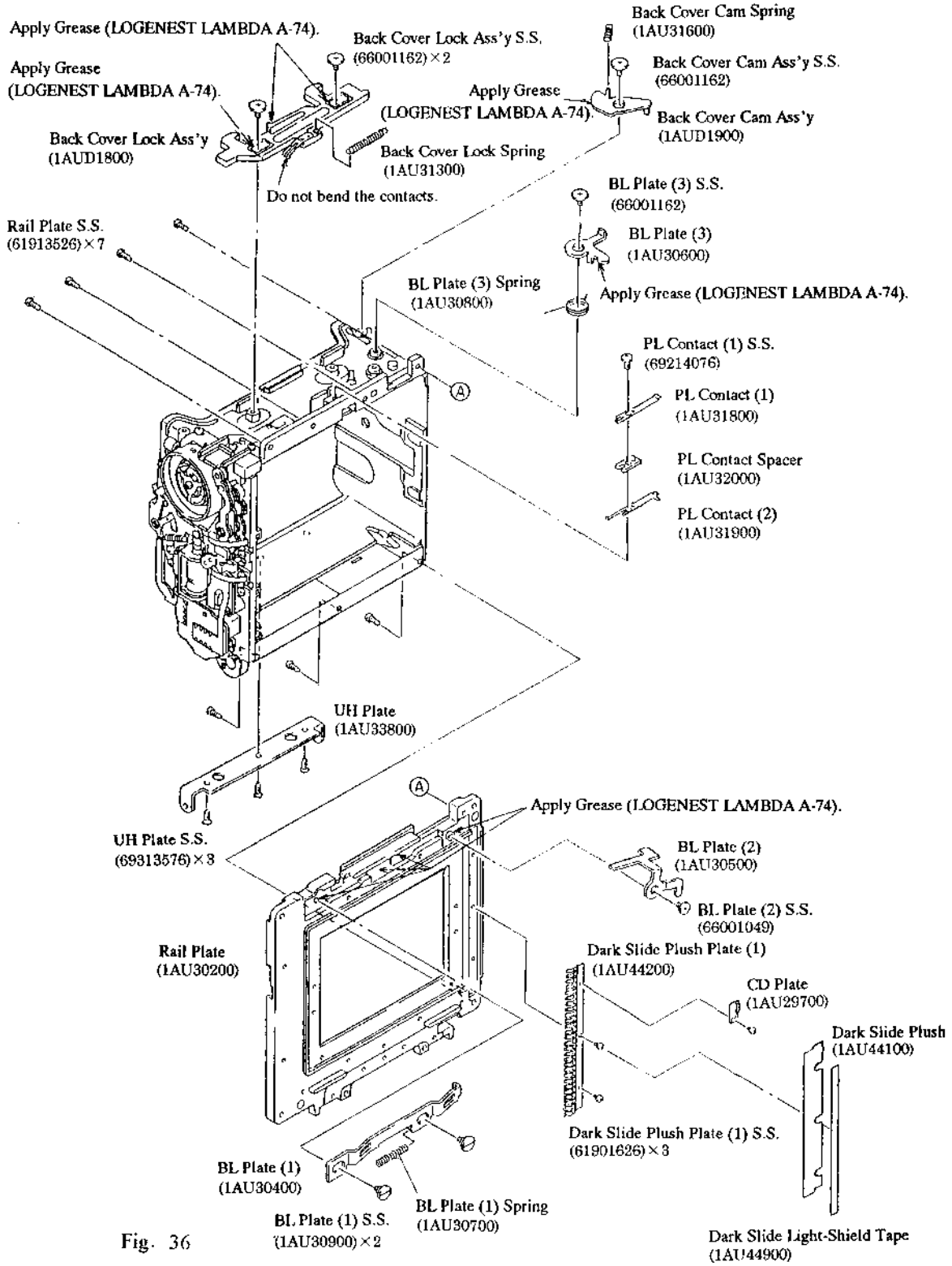


Fig. 36

B-7-3. Removal of Rail Plate

(See Fig. 36)

1) Remove the BL Plate (2) Setscrew (66001049) and take off the BL Plate (2) (1AU30500).
2) Remove the BL Plate (3) Setscrew (66001162) and take off the BL Plate (3) (1AU30600) and BL Plate (3) Spring (1AU30800).
3) Remove the Back Cover Cam Spring (1AU31600). Then remove the Back Cover Cam Ass'y Setscrew (6600 1162) and take off the Back Cover Cam Ass'y (1AUD1900).
4) Remove the Back Cover Lock Ass'y Setscrews (66001162) × 2 and take off the Back Cover Lock Ass'y (1AUD1800).

   Note :

   - Take care not to bend the contacts of the Back Cover Lock Ass'y.

   (See Fig. 37)
5) Unsolder the 2 soldered joints between the FB Switch FPC and the PL Contact (1) (1AU31800) and PL Contact (2) (1AU31900).

   (See Fig. 36)
6) Remove the PL Contact (1) Setscrew (69214076) and take off the PL Contact (1) (1AU31800), PL Contact Spacer (1AU32000) and PL Contact (2) (1AU31900).
7) Remove the BL Plate (1) Setscrews (1AU30900) × 2 and take off the BL Plate (1) (1AU30400) and BL Plate (1) Spring (1AU30700).
8) Remove the UH Plate Setscrews (69313576) × 3 and take off the UH Plate (1AU33800).
9) Peel off the Dark Slide Light-Shield Tape (1AU44900) and Dark Slide Plush (1AU44100).

   Note :

   - Bond has been applied to one side of the Dark Slide Light-Shield Tape (1AU44900) and Dark Slide Plush (1AU44100).
10) Remove the Dark Slide Plush Plate (1) Setscrews (61901626) × 3 and take off the CD Plate (1AU29700) and Dark Slide Plush Plate (1) (1AU44200).

    Note :

    - Do not remove any of the Dark Slide Light-Shield Tape (1AU44900), Dark Slide Plush (1AU44100), CD Plate (1AU29700) and Dark Slide Plush Plate (1) (1AU44200), as a rule.
11) Remove the Rail Plate Setscrews (61913526) × 7 and take off the Rail Plate (1AU30200).

[Notes on Reassembly]

a) Before installing the Back Cover Lock Ass'y (1AUD1800), wipe its contacts and the pattern of the FB Switch FPC.
b) Do not use the Dark Slide Light-Shield Tape (1AU44900) or Dark Slide Plush (1AU44100) which has been peeled off once.
c) Apply Grease (LOGENEST LAMBDA A-74) to the specified positions.

(Top View of Film Back)

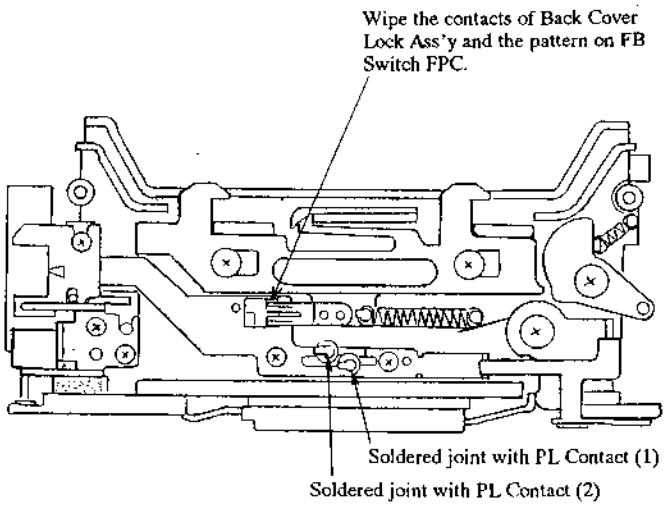

Wipe the contacts of Back Cover Lock Ass'y and the pattern on FB Switch FPC.
Soldered joint with PL Contact (1)
Soldered joint with PL Contact (2)

Fig. 37

[Chart for Removal of Mechanical Parts of Film Back Ass'y]

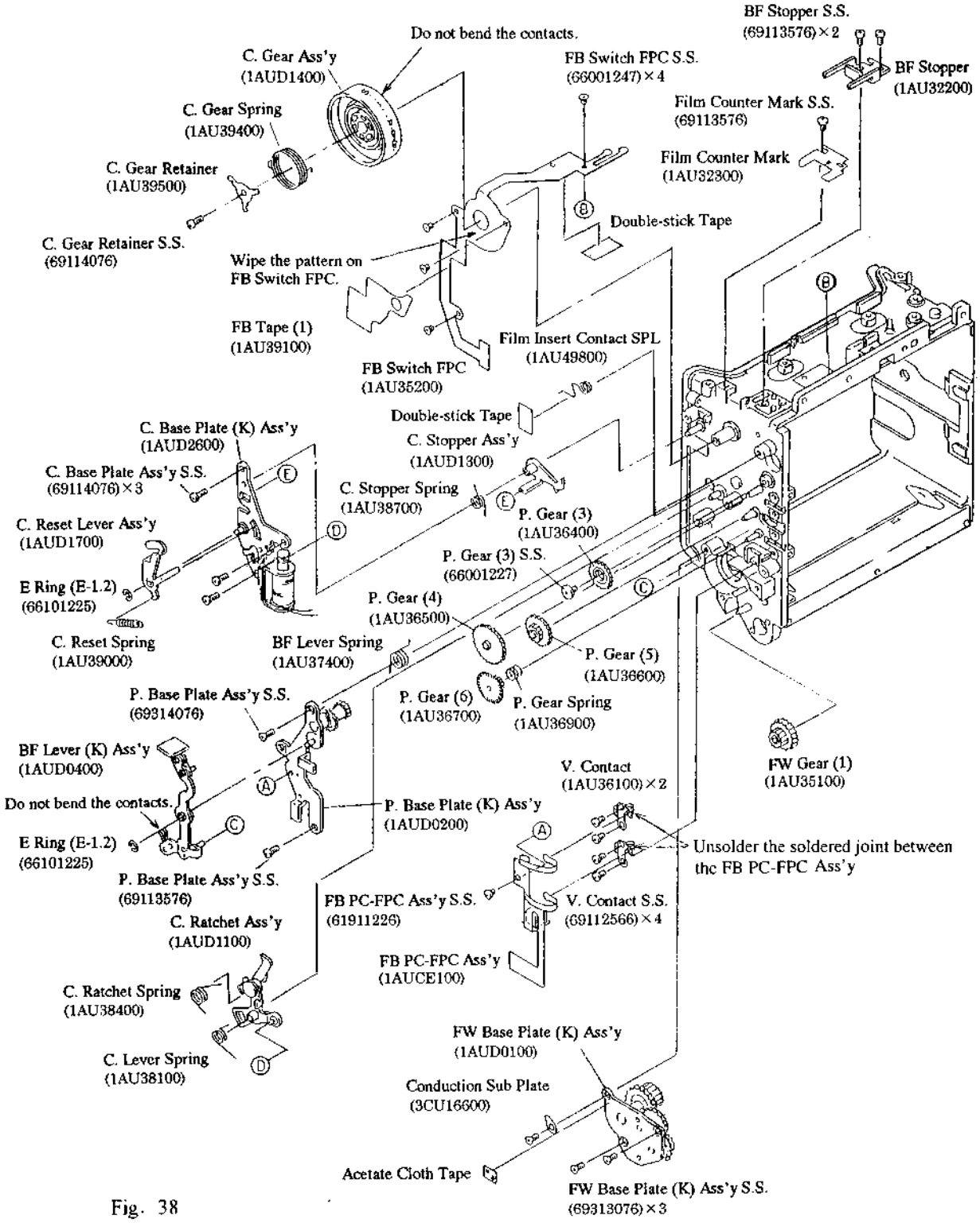


Fig. 38

B-7-4. Removal of Mechanical Parts of Film Back Ass'y

(See Fig. 38)

1) Remove the BF Stopper Setscrews (69113576) × 2 and take off the BF Stopper (1AU32200).
2) Remove the Film Counter Mark Setscrew (69113576) and take off the Film Counter Mark (1AU32300).
3) Remove the C. Gear Retainer Setscrew (69114076) and take off the C. Gear Retainer (1AU39500), C. Gear Spring (1AU39400) and C. Gear Ass'y (1AUD1400).
4) Remove the C. Reset Spring (1AU39000) and E Ring (E-1.2) (66101225) and take off the C. Reset Lever Ass'y (1AUD1700).
5) Remove the C. Base Plate Ass'y Setscrews (69114076) × 3 and take off the C. Base Plate (K) Ass'y (1AUD 2600), C. Stopper Spring (1AU38700) and C. Stopper Ass'y (1AUD1300).
6) Remove the C. Lever Spring (1AU38100).
7) Remove the C. Ratchet Ass'y (1AUD1100) and C. Ratchet Spring (1AU38400).
8) Peel off the FB Tape (1) (1AU39100).
9) Remove the FB Switch FPC Setscrews (66001247) × 4 and take off the FB Switch FPC (1AU35200).

   Note :

   - Take care, since the upper area and the left area of the FB Switch FPC (1AU35200) are fixed with double-stick tape.
10) Unsolder the Black lead wire (from Film Insert Contact SPL) on the Conduction Sub Plate (3CU16600). (See Fig. 39)
11) Peel off the Acetate Cloth Tape, remove the FW Base Plate (K) Ass'y Setscrews (69313076) × 3 and take off the Conduction Sub Plate (3CU16600), FW Base Plate (K) Ass'y (1AUD0100) and FW Gear (1) (1AU3 5100).
12) Remove the E Ring (E-1.2) (66101225) and take off the BF Lever (K) Ass'y (1AUD0400).

    Note :

    - Take care not to bend the contacts of the BF Lever (K) Ass'y (1AUD0400).
13) Remove the FB PC-FPC Ass'y Setscrew (61911226).
14) Remove the P. Base Plate Ass'y Setscrews (69313576), (69113576) and take off the P. Base Plate (K) Ass'y (1AUD0200) and BF Lever Spring (1AU37400).
15) Remove the P. Gear (4) (1AU36500), P. Gear (6) (1AU36700), P. Gear Spring (1AU36900) and P. Gear (5) (1AU36600).
16) Remove the P. Gear (3) Setscrew (66001227) and take off the P. Gear (3) (1AU36400).
17) Unsolder the soldered joints between the FB PC-FPC Ass'y (1AUCE100) and the V. Contacts (1AU36100) × 2 and take off the FB PC-FPC Ass'y (1AUCE100).
18) Remove the V. Contact Setscrews (69112566) × 4 and take off the V. Contact (1AU36100) × 2.
19) Peel off the double-stick tape and take off the Film Insert Contact SPL (1AU49800).

[Notes on Reassembly]

a) Apply Grease (LOGENEST LAMBDA A-74) to the specified positions. (See Fig. 40)
b) Press the P. Gear (6) (1AU36700) gently and make certain that the P. Gear (6) returns to the original position by the force of the P. Gear Spring (1AU36900).
c) After installing the C. Base Plate (K) Ass'y (1AUD2600), check to see if the Solenoid Plunger (1AU54100) and the FW Base Plate (K) Ass'y (1AUD0100) are in parallel with each other. (See Fig. 39)
   If they are not in parallel, loosen the C. Base Plate Ass'y Setscrews (69114076) × 3 and adjust the position of the C. Base Plate Ass'y so that they become in parallel.
d) Once the C. Base Plate (K) Ass'y (1AUD2600) or C. Ratchet Ass'y (1AUD1100) has been replaced with a new one, make the adjustment of the C. Base Plate (K) Ass'y (Counter Gear). (See page B-35)
e) Before installing the BF Lever (K) Ass'y (1AUD0400), wipe its contacts and the pattern on the FB PC-FPC. (See Fig. 39)
f) Before installing the C. Gear Ass'y (1AUD1400), wipe its contacts and the pattern on the FB Switch FPC. (See Fig. 38)
g) Install the parts with attention paid to their locations. (See Fig. 38)

(Chart for Installation of C. Base Plate (K) Ass'y)

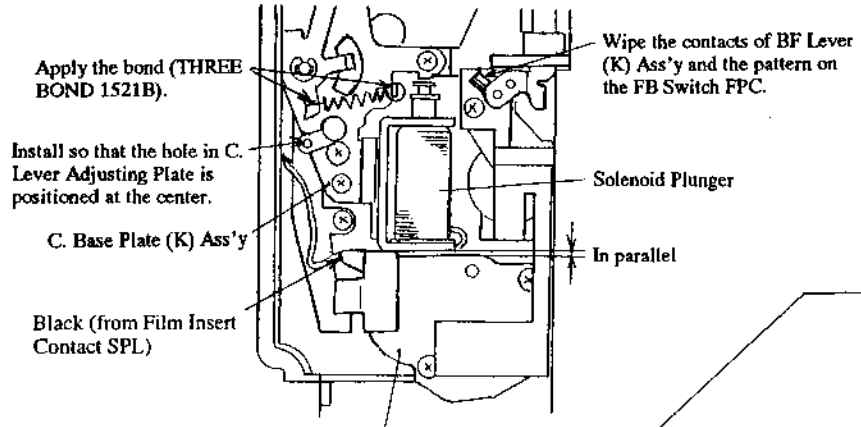

Apply the bond (THREE BOND 1521B).
Wipe the contacts of BF Lever (K) Ass'y and the pattern on the FB Switch FPC.
Install so that the hole in C. Lever Adjusting Plate is positioned at the center.
Solenoid Plunger
C. Base Plate (K) Ass'y
In parallel
Black (from Film Insert Contact SPL)
FW Base Plate (K) Ass'y

Fig. 39

(Chart for Greasing Points on Film Box)

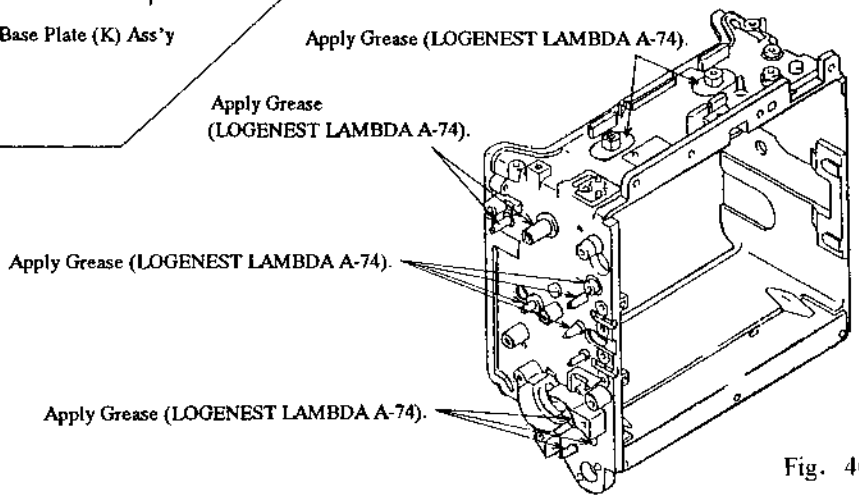

Apply Grease (LOGENEST LAMBDA A-74).
Apply Grease (LOGENEST LAMBDA A-74).
Apply Grease (LOGENEST LAMBDA A-74).
Apply Grease (LOGENEST LAMBDA A-74).

Fig. 40

[Reassembly Procedure for Ass'y Parts]

(1) Reassembly of C. Base Plate Ass'y

1) Install the C. Lever Adjusting Plate (1AUD1600) on the C. Base Plate (K) Ass'y (1AUD2600) and tighten the C. Lever Adjusting Plate Setscrew (63912026).
2) Install the Solenoid Plunger (1AU54100), apply the bond (Loctite #262) to the threaded part of the Solenoid Plunger Setscrews (63901826) × 2 and tighten the screws.

Notes :

- Tighten up the C. Lever Adjusting Plate Setscrew (63912026) after making the adjustment of the Counter Gear.
- Install the C. Lever Adjusting Plate (1AUD 1600) on the C. Base Plate (K) Ass'y (1AUD 2600) so that the hole in the C. Lever Adjusting Plate is positioned at the center of the cut portion of the C. Base Plate (K) Ass'y. (See Fig. 39)
- Install the Solenoid Plunger (1AU54100) in such a position that the Solenoid Plunger is in parallel with the C. Base Plate (K) Ass'y (1AUD2600).

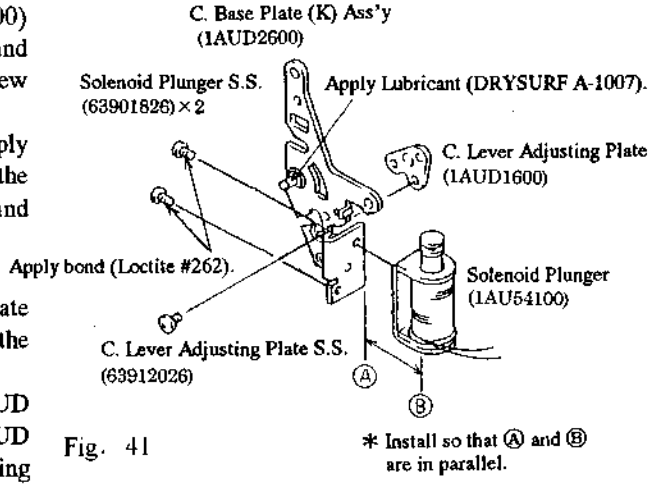

C. Base Plate (K) Ass'y (1AUD2600)
Solenoid Plunger S.S. (63901826) × 2
Apply Lubricant (DRYSURF A-1007).
C. Lever Adjusting Plate (1AUD1600)
Apply bond (Loctite #262).
Solenoid Plunger (1AU54100)
C. Lever Adjusting Plate S.S. (63912026)
Ⓐ
Ⓑ
* Install so that Ⓐ and Ⓑ are in parallel.

Fig. 41

(2) Reassembly of P. Base Plate Ass'y

1) Install the P. Gear (2) (1AU36300) and P. Gear (1) (1AU36200) on the P. Base Plate (K) Ass'y (1AUD0200) and tighten the P. Gear (1) Setscrew (66001274).

Notes :

- Apply Grease (LOGENEST LAMBDA A-74) to the gear shafts.
- Install the P. Gear (1) (1AU36200) and P. Gear (2) (1AU36300) with their cut surfaces aligned with each other.
- The P. Gear (1) Setscrew (66001274) is supplied as a screw processed for prevention of loosening. When it is reused, however, apply the bond (THREE BOND 1375B) to the threaded part.
- Make sure that the gears operate smoothly, without catch.

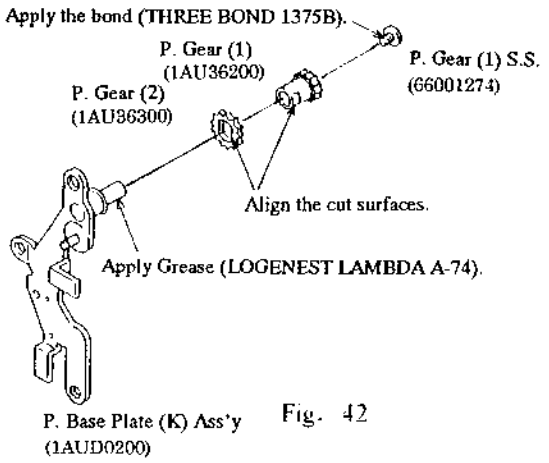


Fig. 42

(3) Reassembly of FW Base Plate Ass'y

1) Install the FW Gear (2) (1AU35200) and FW Gear (3) Ass'y (1AU44500) on the FW Base Plate (K) Ass'y (1AUD1000).
2) Install the FW Gear (5) Ass'y (1AU44600) and tighten the FW Gear (5) Ass'y Setscrew (6600 1298).

Notes :

- Apply Grease (LOGENEST LAMBDA A-74) to the gear shafts.
- The FW Gear (5) Ass'y Setscrew (66001298) is supplied as a screw processed for prevention of loosening. When it is reused, however, apply the bond (Loctite #262) to the threaded part.
- Make sure that the gears operate smoothly, without catch.

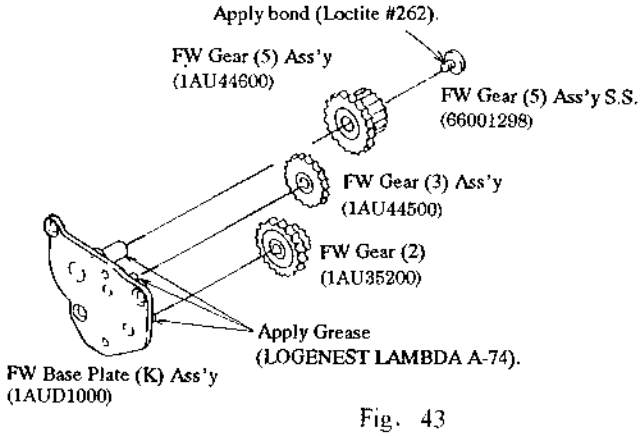


Fig. 43

(4) Reassembly of BF Lever Ass'y

1) Install the BF Foot (1AU37000) on the BF Lever (K) Ass'y (1AUD0400) and tighten the BF Foot Setscrew (66001190).

Notes :

- Pay attention to the orientation of the BF Foot (1AU37000).
- Take care not to bend the contacts of the BF Lever (K) Ass'y (1AUD0400). Before installing the BF Lever (K) Ass'y on the Film Box, wipe the contacts.

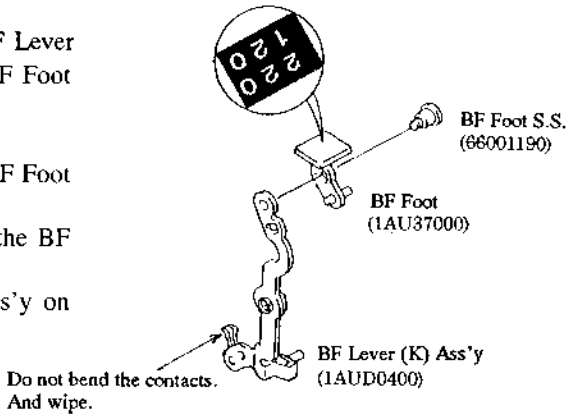


Fig. 44

(5) Reassembly of Rail Plate

1) Install the AP Roller Holder Ass'y (1AUD0800) and tighten the AP Roller Holder Ass'y Setscrews (6600 1292) × 2.
2) Install the AP Roller (1AU34700) in such a way that the hole in the AP Roller is put on the pin of the AP Roller Holder Ass'y (1AUD0800).
3) Insert the pin of the AP Roller Holder (R) Ass'y (1AUD2800) into the hole in the AP Roller (1AU34700) and tighten the AP Roller Holder (R) Ass'y Setscrews (66001292) × 2.
4) Insert both ends of the AP Roller (S) (1AU34200) into the holes in the AP Roller Holder (S) (1AU34300), install the AP Roller Holder (S) (1AU34300) and tighten the AP Roller Holder (S) Setscrews (66001292) × 2.

Note :

- Apply Grease (LOGENEST LAMBDA A-74) to the pins of the AP Roller Holder Ass'y (1AUD0800) and AP Roller Holder (R) Ass'y (1AUD2800) and both ends of the AP Roller (S) (1AU34200).
  Do not apply grease to any part other than specified.

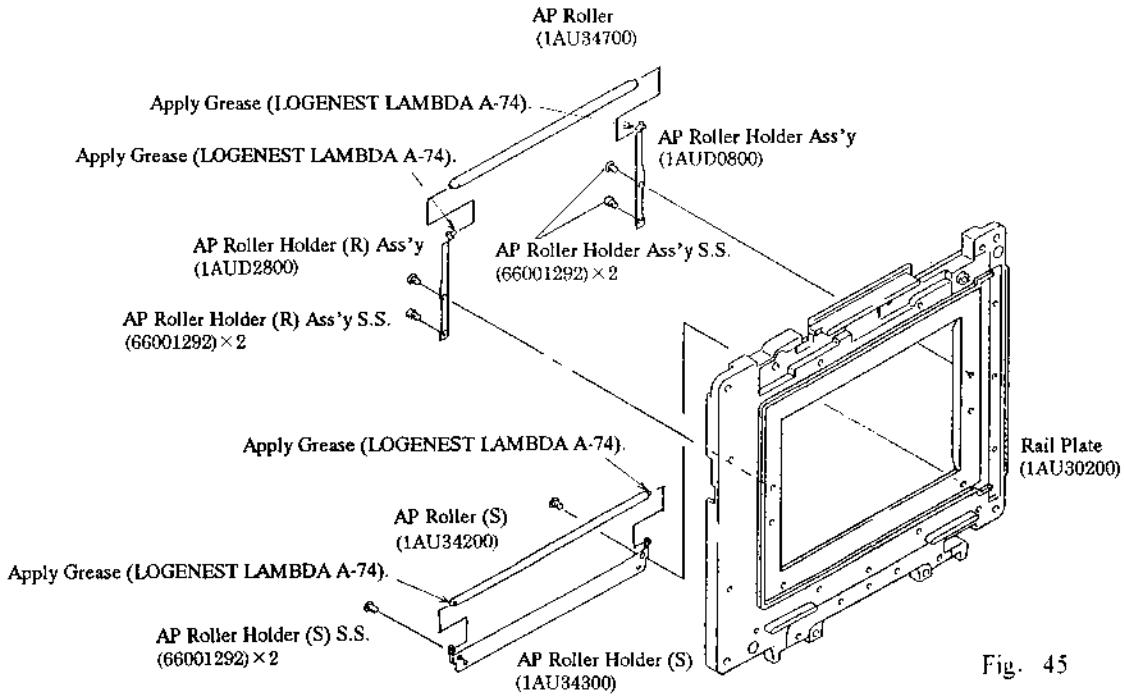


Fig. 45

(6) Reassembly of FB Side Cover (R) Ass'y

1) Install the B. Lock Base Ass'y (1AUD2400) and Back Cover Lever (1AU42000) and tighten the Back Cover Lever Setscrew (66001049).
2) Hook the Back Cover Lever Spring (1AU42100).
3) Install the BL Button Ass'y (1AUD2700) and BL Button Spring (1AU41800) and set the E Ring (E-1.2) (66 101225).

Notes :

- Set the long end of the BL Button Spring (1AU41800) on the BL Button Ass'y (1AUD2700) and insert this end into the groove in the BL Button Ass'y (1AUD2700). Insert the short end of the BL Button Spring into the groove in the FB Side Cover (R) Ass'y.

4) Install the Multiple Exposure Lock Button (1AU42300) and Multiple Exposure Lock Spring (1AU42400) and set the E Ring (E-1.2) (66101225).

5) Install the Multiple Exposure Lever (1AU42500), Steel Ball (ϕ 1.5) (66701520) and Multiple Exposure Contact (1AU42600) and tighten the Multiple Exposure Contact Setscrews (69102566) × 2.
   Note :
   - Take care not to bend the contacts of the Multiple Exposure Contact (1AU42600). Before installing the FB Side Cover (R) Ass'y on the Film Box, wipe the contacts.
6) Install the ISO Dial (1AU42800), ISO Plate (1AU42900) and ISO Brush Contact (1AU43000) and tighten the ISO Brush Contact Setscrews (69112566) × 2.
   Notes :
   - Align the Orange mark on the ISO Dial (1AU42800) with the Index of FB Side Cover (R).
   - Take care not to bend the contacts of the ISO Brush Contact (1AU43000). Before installing the FB Side Cover (R) Ass'y on the Film Box, wipe the contacts.
7) Install the ISO Lock Release Button (1AU43300) and ISO Lock Plate (1AU43400) and tighten the ISO Lock Plate Setscrews (69112566) × 2.

[Notes on Reassembly]

a) Apply Grease (FLOILG-474B) to the holes in the FB Side Cover (R) Ass'y and the slide surfaces of the parts to be installed.
b) Apply the bond (THREE BOND 1521B) to the head of each Setscrew.

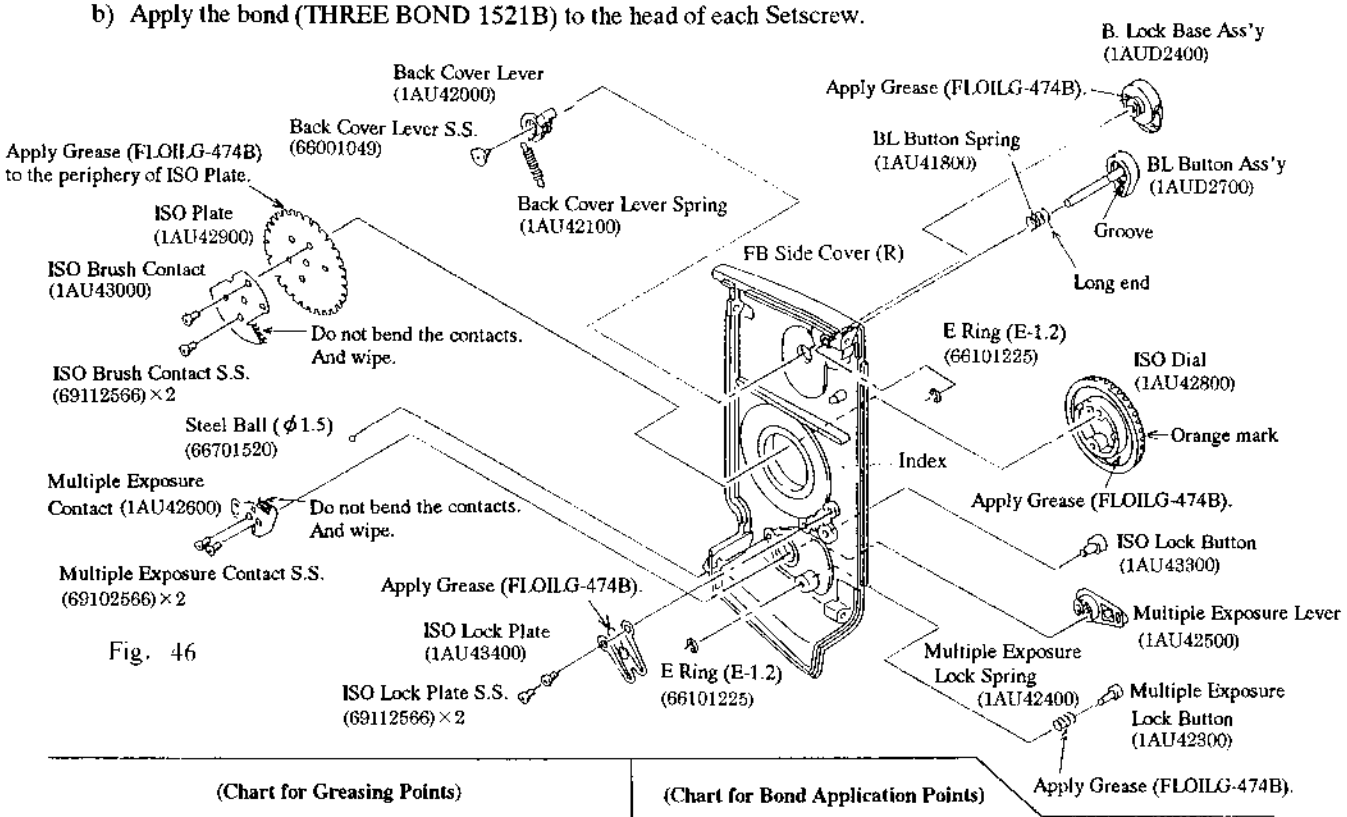


Fig. 46

(Chart for Greasing Points)

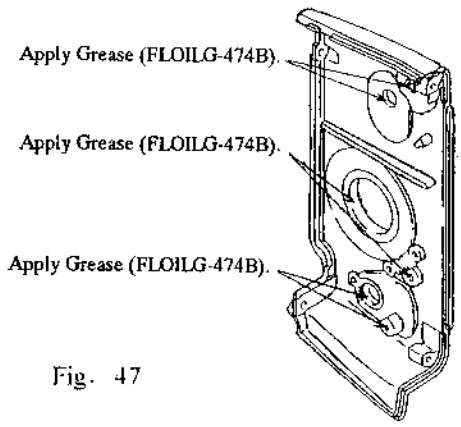


Fig. 47

(Chart for Bond Application Points)

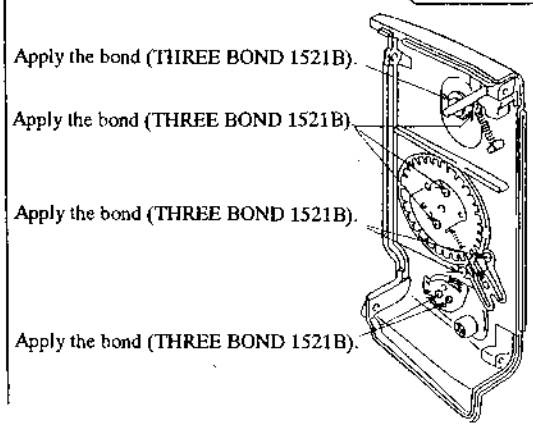

Apply the bond (THREE BOND 1521B).
Apply the bond (THREE BOND 1521B).
Apply the bond (THREE BOND 1521B).
Apply the bond (THREE BOND 1521B).

Fig. 48

[Installation & Adjustment Procedure for Counter Gear]

(See Figs. 49 and 50)

1) Apply Grease (LOGENEST LAMBDA A-74) to the gear of the C. Gear Ass'y (1AUD1400) (Counter Gear).
   Note :
   - Do not apply grease to the contacts of the C. Gear Ass'y.
2) While putting aside the C. Ratchet Ass'y (1AUD1100) and C. Stopper Ass'y (1AUD1300), install the C. Gear Ass'y.
3) While putting aside the C. Ratchet Ass'y and C. Stopper Ass'y, turn the C. Gear Ass'y clockwise and set it at the position of the counter character "S".
4) Hook the end of the C. Gear Spring (1AU39400) into the hole in the C. Gear Ass'y.
   Note :
   - Pay attention to the orientation of the C. Gear Spring.
5) Install the C. Gear Retainer (1AU39500), hook the end of the C. Gear Spring and tighten temporarily the C. Gear Retainer Setscrew (69114076).
   Note :
   - Do not hook the end of the C. Gear Spring onto the cut portion of the C. Gear Retainer.
6) Turn the C. Gear Retainer clockwise until the hook of the C. Gear Spring comes to a position of the counter numerals "24 ~ 26", and then tighten up the C. Gear Retainer Setscrew.
7) Apply the bond (THREE BOND 1521B) to the head of the C. Gear Retainer Setscrew.

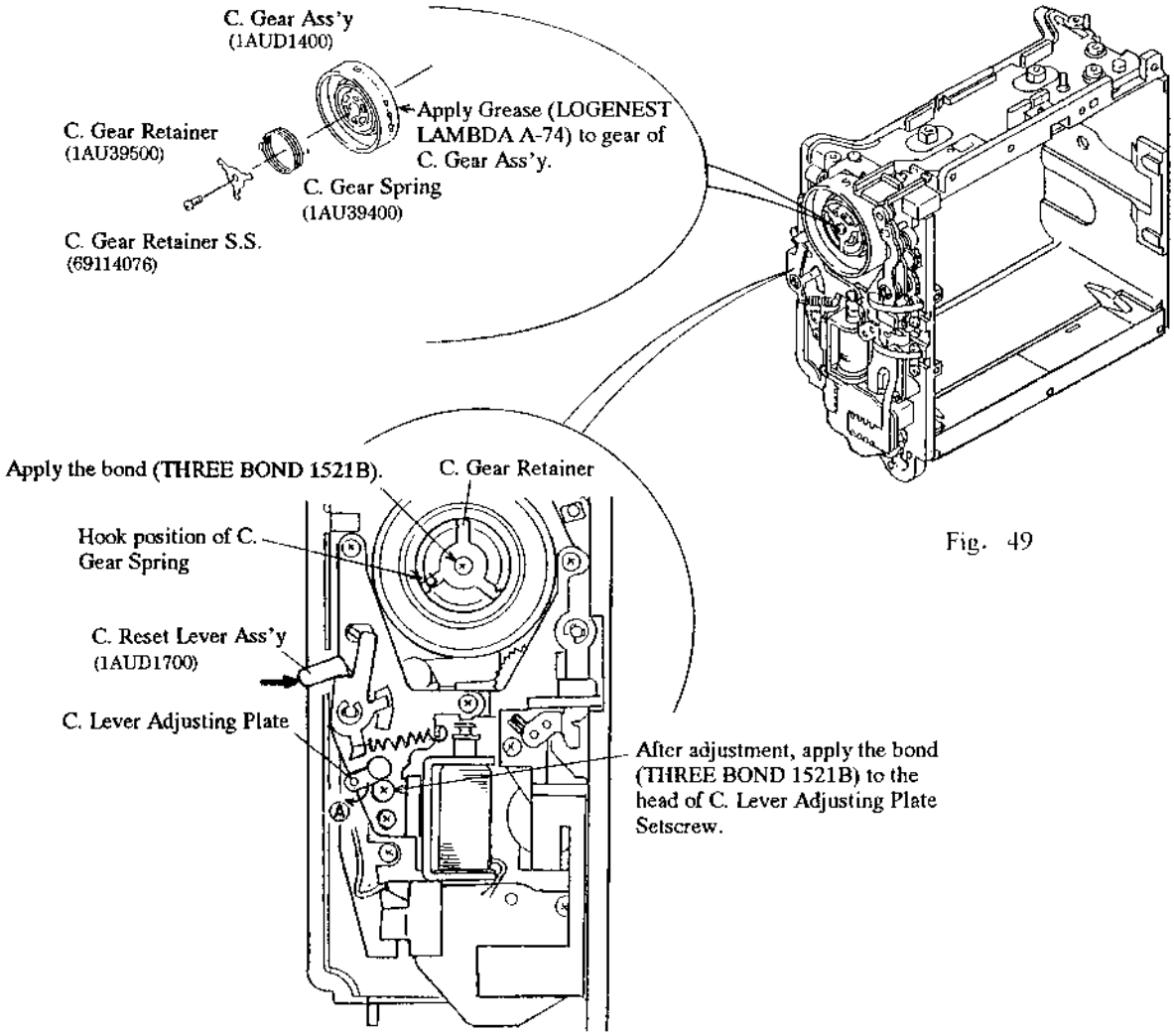

C. Gear Ass'y
(1AUD1400)
Apply Grease (LOGENEST LAMBDA A-74) to gear of C. Gear Ass'y.
C. Gear Retainer
(1AU39500)
C. Gear Spring
(1AU39400)
C. Gear Retainer S.S.
(69114076)
Apply the bond (THREE BOND 1521B).
C. Gear Retainer
Hook position of C. Gear Spring
C. Reset Lever Ass'y
(1AUD1700)
C. Lever Adjusting Plate
After adjustment, apply the bond (THREE BOND 1521B) to the head of C. Lever Adjusting Plate Setscrew.

Fig. 49

8) As shown in Fig. 50, apply Grease (LOGENEST LAMBDA A-74) to the C. Stopper Spring (1AU38700) and C. Ratchet Spring (1AU38400).
9) Push the C. Reset Lever Ass'y (1AUD1700) in the direction of the arrow. (See Fig. 49)
10) Under the condition of 9), push down gently the shaft of the Solenoid Plunger, and the C. Lever will push up the C. Gear Ass'y and the counter will move forward by one frame. And the C. Stopper Ass'y will be engaged with the gear of the C. Gear Ass'y. Then make certain that there is a play between the C. Stopper Ass'y and the gear of the C. Gear Ass'y.
11) Adjust the position of the C. Lever Adjusting Plate so that one operation of the shaft of the Solenoid Plunger will move the counter forward by one frame.
If the C. Lever can not move completely by pushing, move the C. Lever Adjusting Plate in the direction of the arrow Ⓐ. (See Fig. 49)
12) Tighten up the C. Lever Adjusting Plate Setscrew (63912026).
Apply the bond (THREE BOND 1521B) to the head of the C. Lever Adjusting Plate Setscrew. (See Fig. 49)
13) Make certain that when the C. Reset Lever Ass'y is released, the C. Gear Ass'y returns to the position of counter "S".

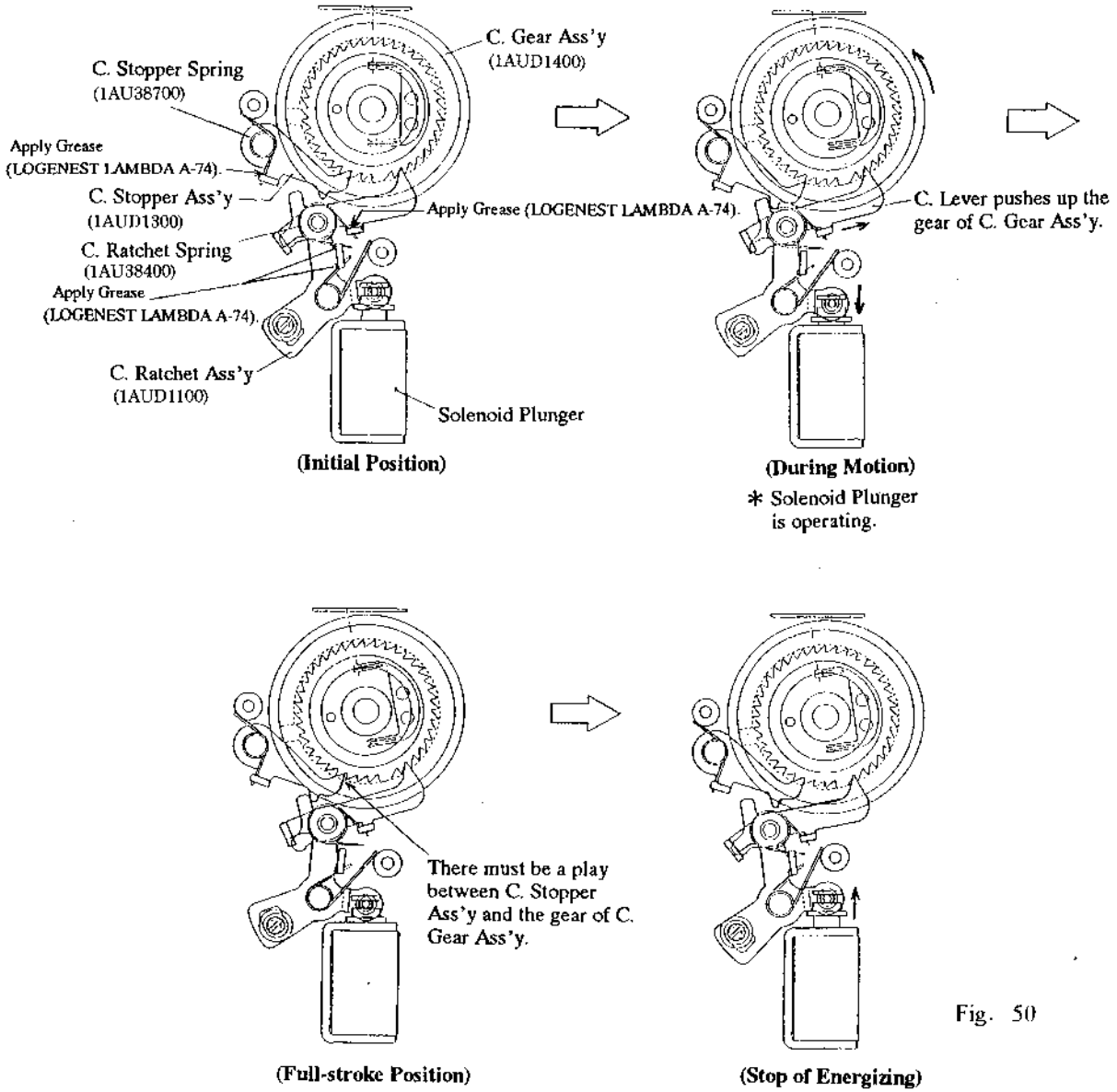


Fig. 50

[How to Check Bar Code Read-in Function]

1) Mount the Film Back Holder and AE Prism Finder on the camera body.
2) Set a roll of FUJICHROME Velvia (ISO 50) film in the 120/220 Film Insert.
3) Put the 120/220 Film Insert in the Film Back Holder.
4) Set the Orange mark "—" (bar code position) on the ISO Dial to the Index on the Film Back Holder.
5) Turn the Main Switch "ON". Then depress the Shutter Release Button, and blank shots advance will take place to advance the film automatically to the first frame.
6) Press the Mirror Up Button on the camera body to move the Mirror up.
7) Press the Aperture Stop-down Button, and the ISO value read in will be indicated at the viewfinder display. Make certain that the viewfinder display shows "50" (FUJICHROME Velvia).
8) By rewinding the same film, repeat the steps 2) to 7) three times.
   At each time, make certain that the viewfinder display indicates "50". Successful completion of these steps shows the level adjustment of the Photo-reflector is correct.

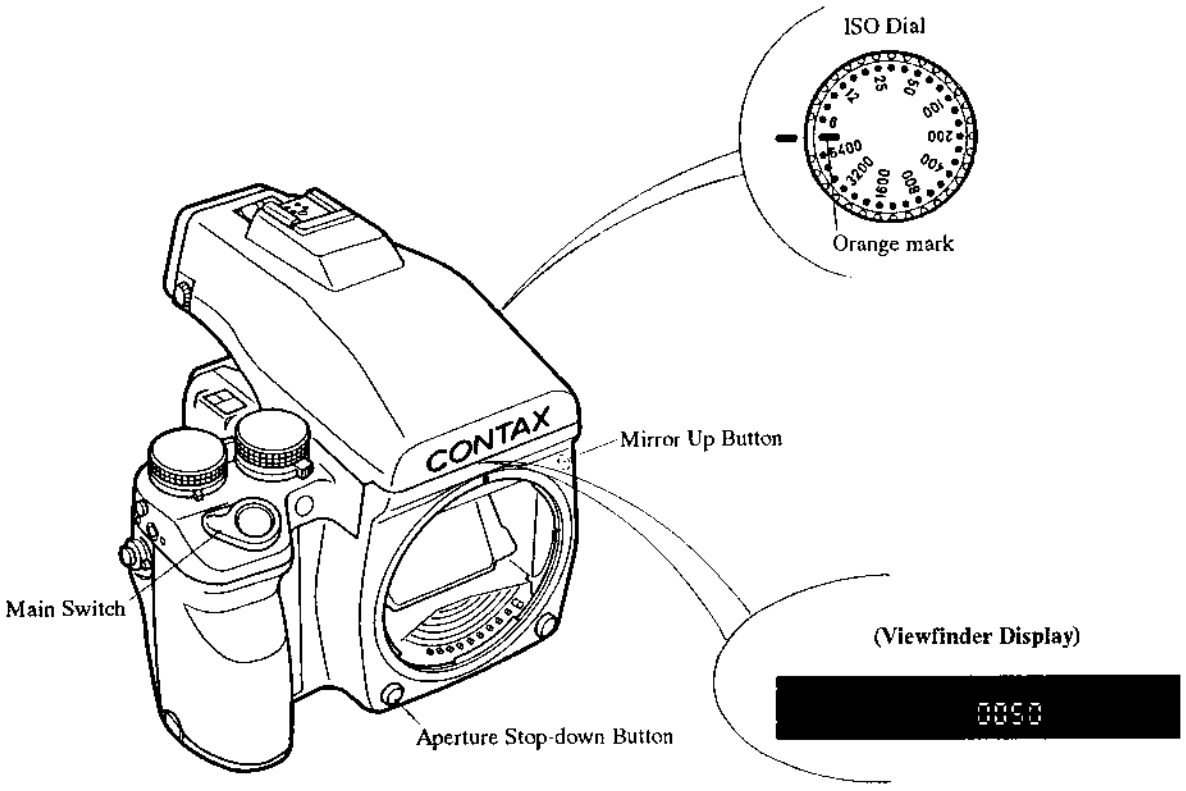


Fig. 51

B-8. DISASSEMBLY OF AE PRISM FINDER ASS'Y

[Chart for Removal of Exterior Parts of AE Prism Finder Ass'y]

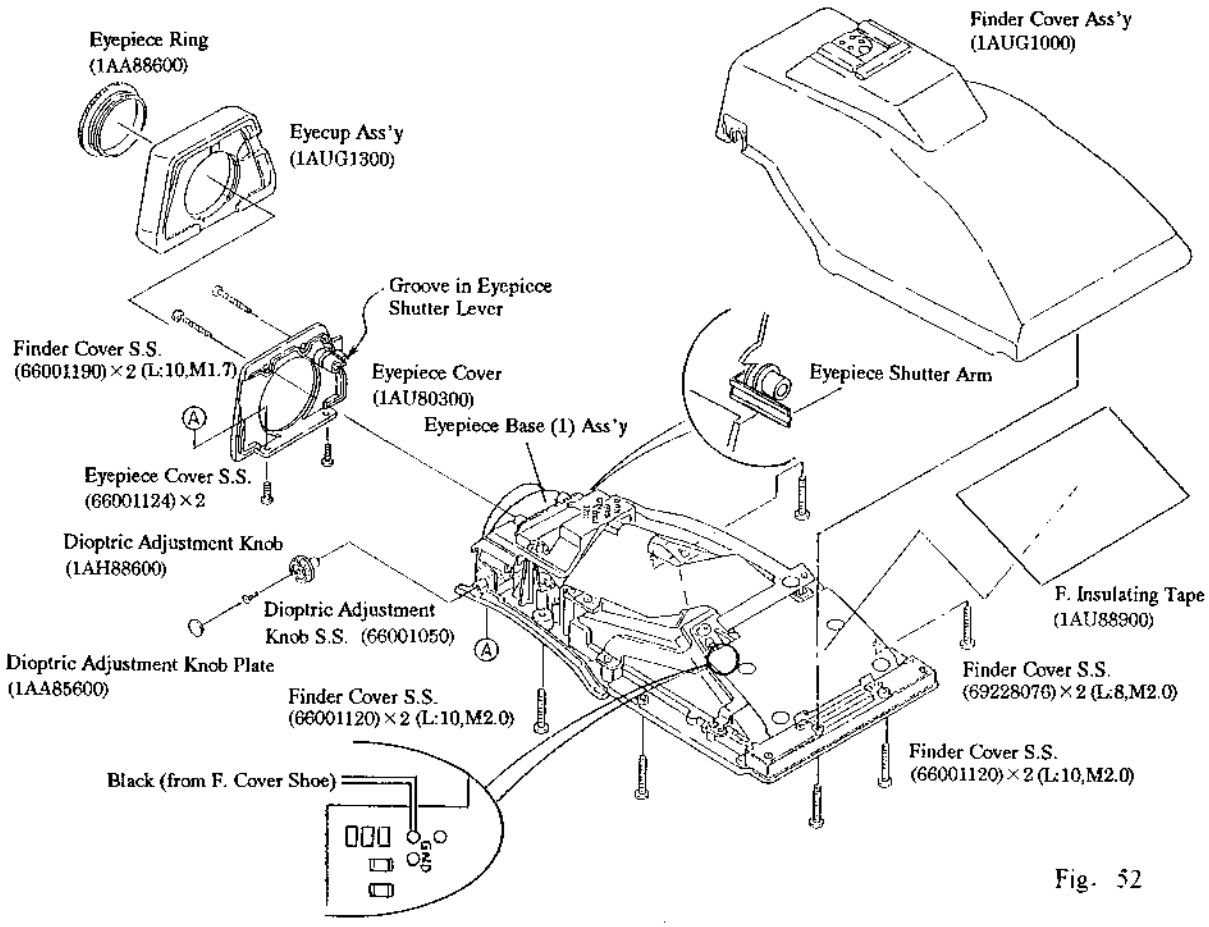


Fig. 52

B-8-1. Removal of Exterior Parts of AE Prism Finder Ass'y

1) Peel off the Dioptric Adjustment Knob Plate (1AA85600).
   Note :
   - The Dioptric Adjustment Knob Plate (1AA85600) is fixed to the Dioptric Adjustment Knob Setscrew (66001050) with double-stick tape.
2) While holding the Dioptric Adjustment Knob (1AH88600), remove the Dioptric Adjustment Knob Setscrew (66001050), and then take off the Dioptric Adjustment Knob.
3) Remove the Eyepiece Ring (1AA88600) and take off the Eyecup Ass'y (1AUG1300).
4) Remove the Finder Cover Setscrews (66001170) × 2, (66001120) × 4, (69228070) × 2 and take off the Finder Cover Ass'y (1AUG1000).
   Note :
   - Since the Finder Cover Setscrews have different sizes, take due care when tightening them.
5) Remove the Eyepiece Cover Setscrews (66001124) × 2 and take off the Eyepiece Cover (1AU80300).
6) Peel off the F. Insulating Tape (1AU88900).
7) Unsolder the Black lead wire (from F. Cover Shoe) on the Finder FPC Ass'y.

[Note on Installation of Eyepiece Cover]

a) Install the Eyepiece Cover (1AU80300) while fitting the groove of the Eye-piece Shutter Lever (1AU87700) on the Eyepiece Shutter Arm of the Eyepiece Base (1) Ass'y.

[Chart for Removal of Finder FPC Ass'y]

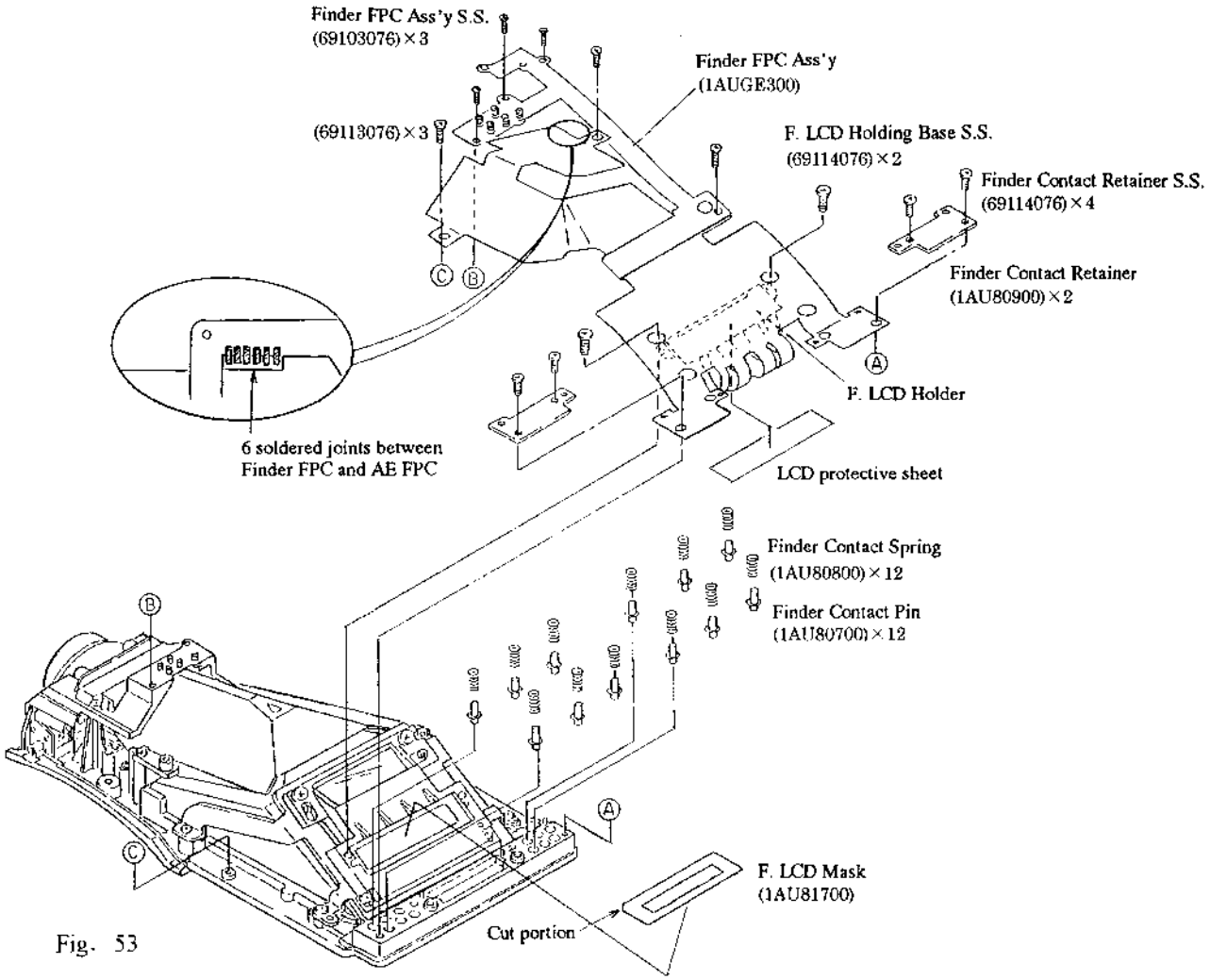


Fig. 53

B-8-2. Removal of Exterior Parts of Finder FPC Ass'y

1) Unsolder the 6 soldered joints between the Finder FPC and the AE FPC.
2) Remove the Finder Contact Retainer Setscrews (69114076) × 4 and take off the Finder Contact Retainers (1AU80900) × 2.
   Note :
   - Take care, since Finder Contact Springs (1AU80800) can spring out when removing the Finder Contact Retainers (1AU80900) × 2.
3) While lifting the Finder FPC, remove the Finder Contact Springs (1AU80800) × 12 and Finder Contact Pins (1AU80700) × 12.
4) Remove the Finder FPC Ass'y Setscrews (69103076) × 3, (69113076) × 3.
5) Remove the F. LCD Holding Base Setscrews (69114076) × 2 and take off the Finder FPC Ass'y (1AUGE300) and F. LCD Mask (1AU81700).

[Notes on Installation of F. LCD Mask and Finder FPC Ass'y]

a) Install the F. LCD Mask (1AU81700) with its cut portion positioned at top left.
b) When replacing the Finder FPC Ass'y (1AUGE300) with a new one, peel off the LCD protective sheet from the new Finder FPC Ass'y first and then install it.

[Chart for Removal of Prisms]

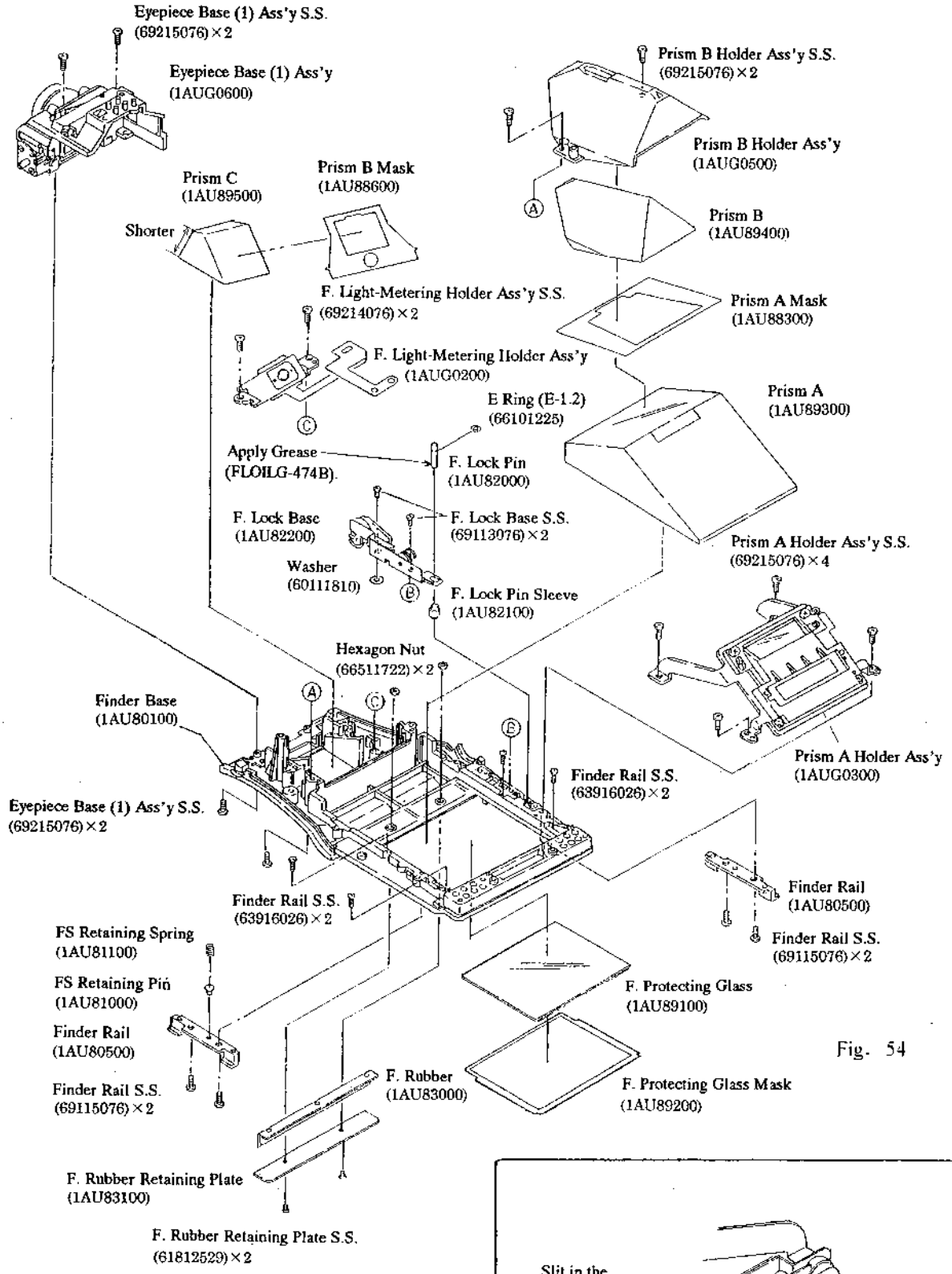


Fig. 54

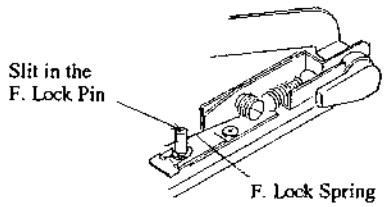


Fig. 55

B-8-3. Removal of Prisms

(See Figs. 54 and 55)

1) Unhook the F. Lock Spring (1AU82500) from the slit in the F. Lock Pin (1AU82000).
2) Remove the E Ring (E-1.2) (66101225) and take off the F. Lock Pin (1AU82000).
3) Remove the F. Lock Base Setscrews (69113076) × 2 and take off the F. Lock Base (1AU82200), Washer (60111810) and F. Lock Pin Sleeve (1AU82100).
4) Remove the Finder Rail Setscrews (63916026) × 4.
5) Remove the Finder Rail Setscrews (69115076) × 4 and take off the Finder Rails (1AU80500) × 2, FS Retaining Pin (1AU81000) and FS Retaining Spring (1AU81100).
6) Remove the F. Protecting Glass Mask (1AU89200) and take off the F. Protecting Glass (1AU89100).
7) Remove the Eyepiece Base (1) Ass'y Setscrews (69215076) × 4 and take off the Eyepiece Base (1) Ass'y (1AUG0600).
8) Remove the Prism B Holder Ass'y Setscrews (69215076) × 2 and take off the Prism B Holder Ass'y (1AUG 0500) and Prism B (1AU89400).
9) Remove the Prism A Holder Ass'y Setscrews (69215076) × 2 and take off the Prism A Holder Ass'y (1AUG 0300), Prism B Mask (1AU88600), Prism A Mask (1AU88300), Prism C (1AU89500) and Prism A (1AU8 9300).
10) Remove the F. Light-Metering Holder Ass'y Setscrews (69214076) × 2 and take off the F. Light-Metering Holder Ass'y (1AUG0200).
11) Remove the Hexagon Nuts (66511722) × 2 and F. Rubber Retaining Plate Setscrews (61812529) × 2 and take off the F. Rubber Retaining Plate (1AU83100) and F. Rubber (1AU83000).

[Notes on Installation of Prisms]

a) Clean the Finder Base (1AU80100) of dust and fluff, using a blower.
b) Make sure that all the Prisms are free from dust, fluff and uneven wiping.
c) Pay attention to the orientation of the Prism C (1AU89500).
d) Install the Prism A Mask (1AU88300) with its burr side up and the Prism B Mask (1AU88600) with its burr side down.
e) After installing all the parts, look through the eyepiece and make certain that there is no dirt, dust, fluff or uneven wiping in the viewfinder.
f) Once the Prism A Holder Ass'y (1AUG0300) has been replaced with a new one, make the adjustment of viewfinder display inclination.

[Adjustment Procedure for Viewfinder Display Inclination]

* Before installing the Finder Cover Ass'y (1AUG 1000), make the adjustment of viewfinder display inclination.
* The adjustment of viewfinder display inclination is to be made with your eye placed at the center of the eyepiece so that you can see all the indications without vignetting.

① Loosen the F. LCD Holder Ass'y Setscrews (× 4).
② Mount the AE Prism Finder Ass'y on the camera body.
③ Make adjustment by turning the F. LCD Adjusting Pins (× 2).
④ Tighten the F. LCD Holder Ass'y Setscrews (× 4).

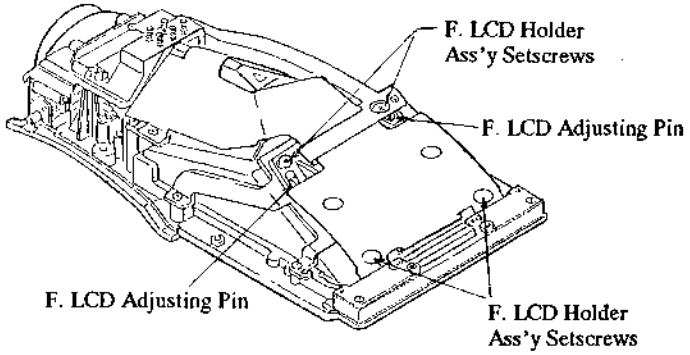


Fig. 56

No.	419-01-41-RA1AU01

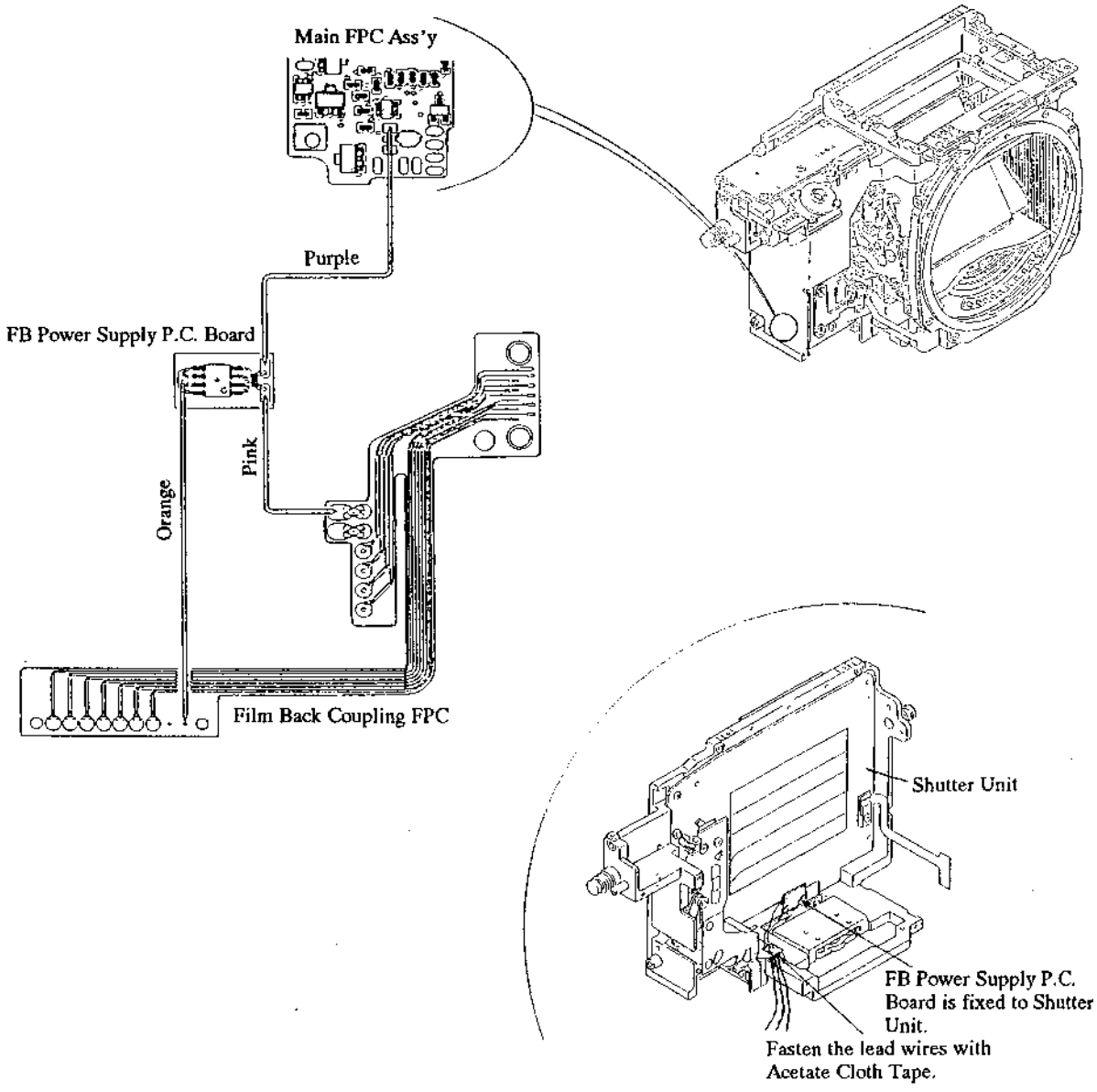
■ PARTS MODIFICATION LIST

[1] Addition of FB Power Supply P.C. Board

In initial production, as a temporary measure to improve quality at low temperature, the supply circuit for FB power was changed and the FB Power Supply P.C. Board was added. In the course of production, however, as the permanent measure, the Main FPC Ass'y was improved and the FB Power Supply P.C. Board was disused.
This Service Manual describes the new type Main FPC Ass'y.
The old type Main FPC Ass'y will not be supplied, but only the new type Main FPC Ass'y will be supplied.
Follow the repair procedures described below to repair the old type Main FPC Ass'y.

a) Location of FB Power Supply P.C. Board :
① The FB Power Supply P.C. Board is fixed to the Shutter Unit with double-stick tape.

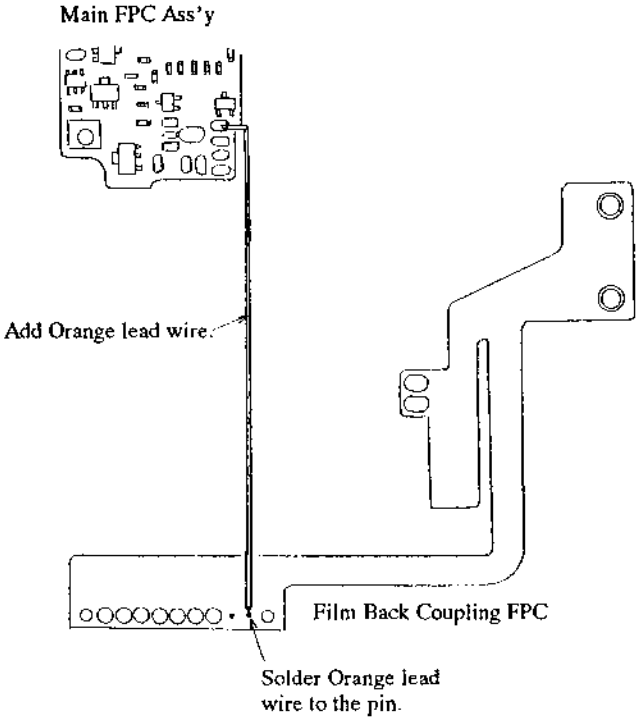
b) Lead wire connection diagram :



c) Repair Information :

① There is an interchangeability between the old type Main FPC Ass'y and the new type Main FPC Ass'y.

② Remove the FB Power Supply P.C. Board and install the new Main FPC Ass'y in the Camera Body. Then add an Orange lead wire as shown below.

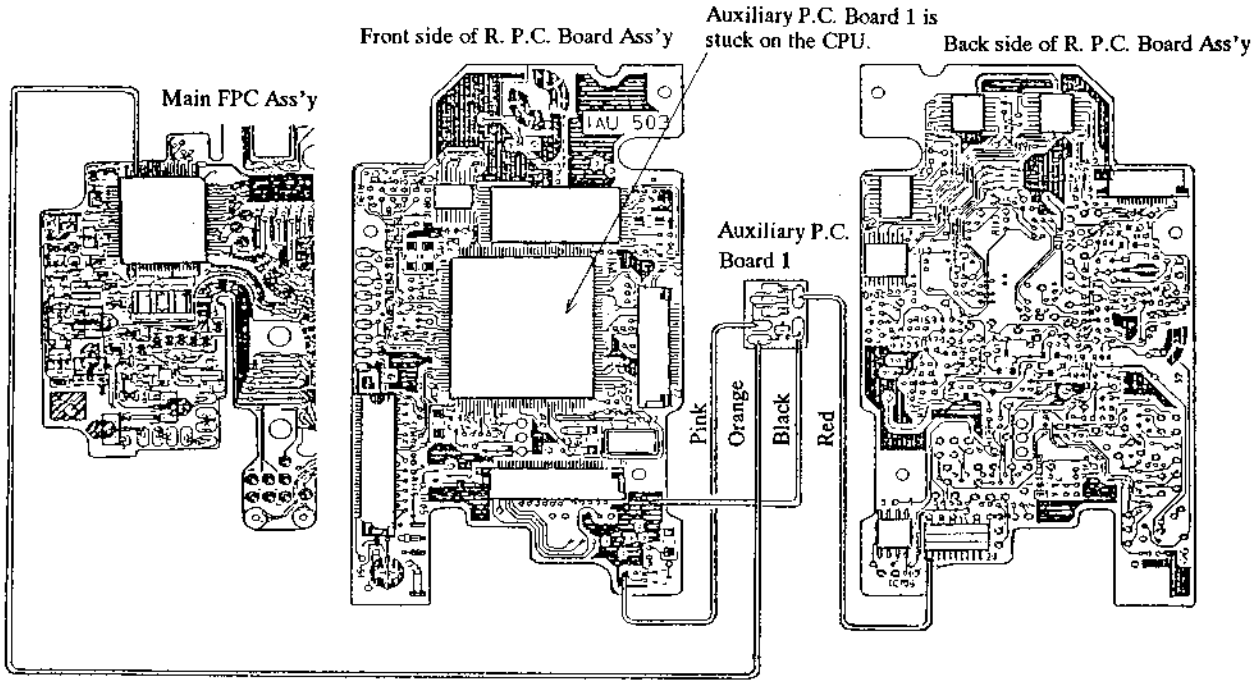


[2] Addition of Auxiliary P.C. Board 1

In initial production, as a temporary measure to improve the quality of the RISC CPU, the Auxiliary P.C. Board 1 was added. In the course of production, however, as the permanent measure, the Main FPC Ass'y and R. P.C. Board Ass'y were improved and the Auxiliary P.C. Board 1 was disused.
This Service Manual describes the new type Main FPC Ass'y and new type R. P.C. Board Ass'y.
Neither the old type Main FPC Ass'y nor the old type R. P.C. Board Ass'y will be supplied, but only the new type Main FPC Ass'y and the new type R. P.C. Board Ass'y will be supplied.
Follow the repair procedures described below to repair the old type Main FPC Ass'y or old type R. P.C. Board Ass'y.

a) Location of Auxiliary P.C. Board 1 :
① The Auxiliary P.C. Board is fixed to the CPU on the R. P.C. Board Ass'y with double-stick tape.

b) Lead wire connection diagram :



c) Repair Information :
① There is an interchangeability between the old type and the new type of the Main FPC Ass'y and R. P.C. Board Ass'y.
② Remove the Auxiliary P.C. Board 1 and install the new type Main FPC Ass'y and new type R. P.C. Board Ass'y in the Camera Body.

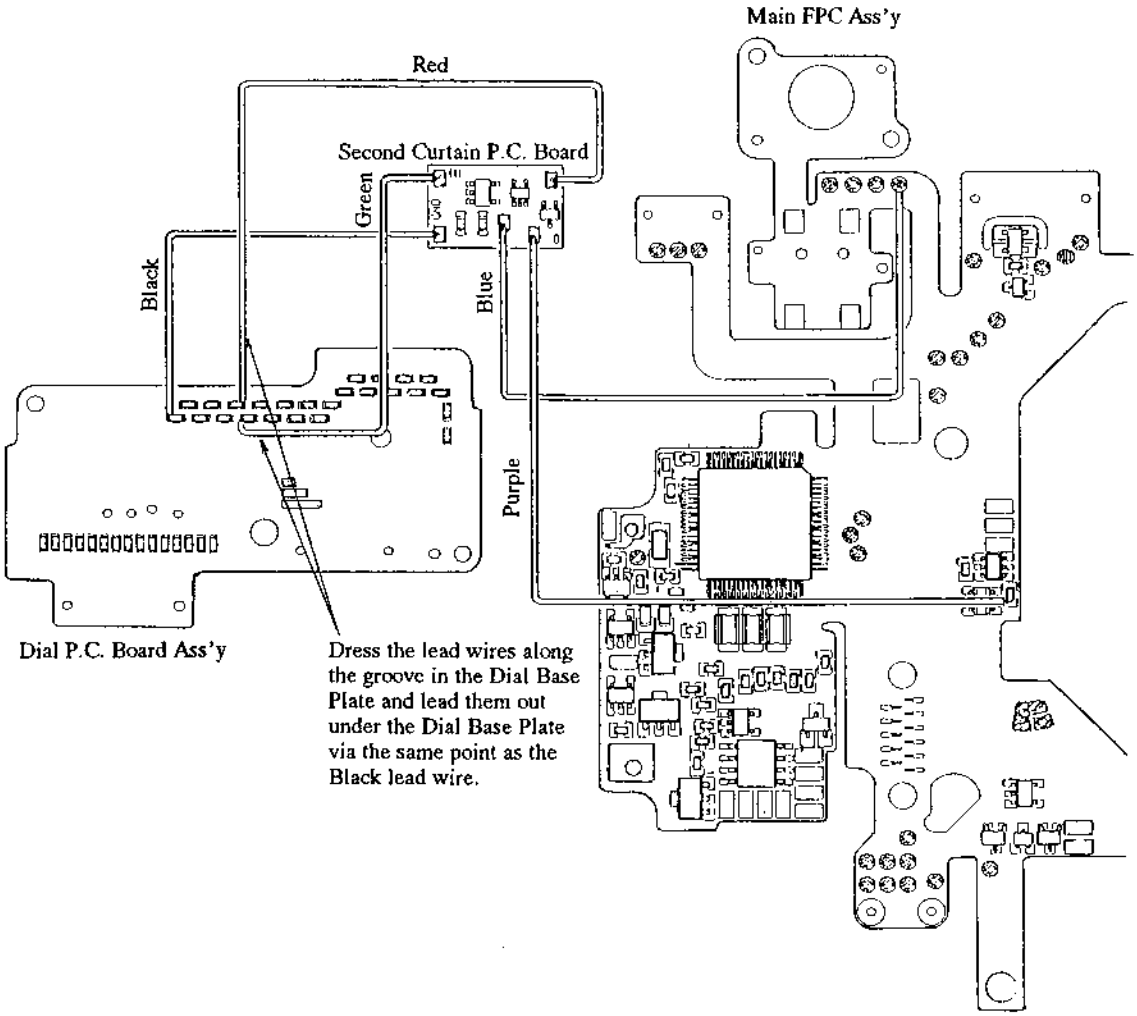
Note :
- Replace both the old type Main FPC Ass'y and old type R. P.C. Board Ass'y with the new type ones.

[3] Addition of Second Curtain P.C. Board

In initial production, as a temporary measure to improve the quality of the shutter, the Second Curtain P.C. Board was added. In the course of production, however, as the permanent measure, the Main FPC Ass'y was improved and the Second Curtain P.C. Board was disused.
This Service Manual describes the new type Main FPC Ass'y.
The old type Main FPC Ass'y will not be supplied, but only the new type Main FPC Ass'y will be supplied.
Follow the repair procedures described below to repair the old type Main FPC Ass'y.

a) Location of Second Curtain P.C. Board :
   ① The Second Curtain P.C. Board is fixed to the Camera Body under the Shutter P.C. Board with double-stick tape.

b) Lead wire connection diagram :


Main FPC Ass'y
Red
Second Curtain P.C. Board
Green
Black
Blue
Purple
Dial P.C. Board Ass'y
Dress the lead wires along the groove in the Dial Base Plate and lead them out under the Dial Base Plate via the same point as the Black lead wire.

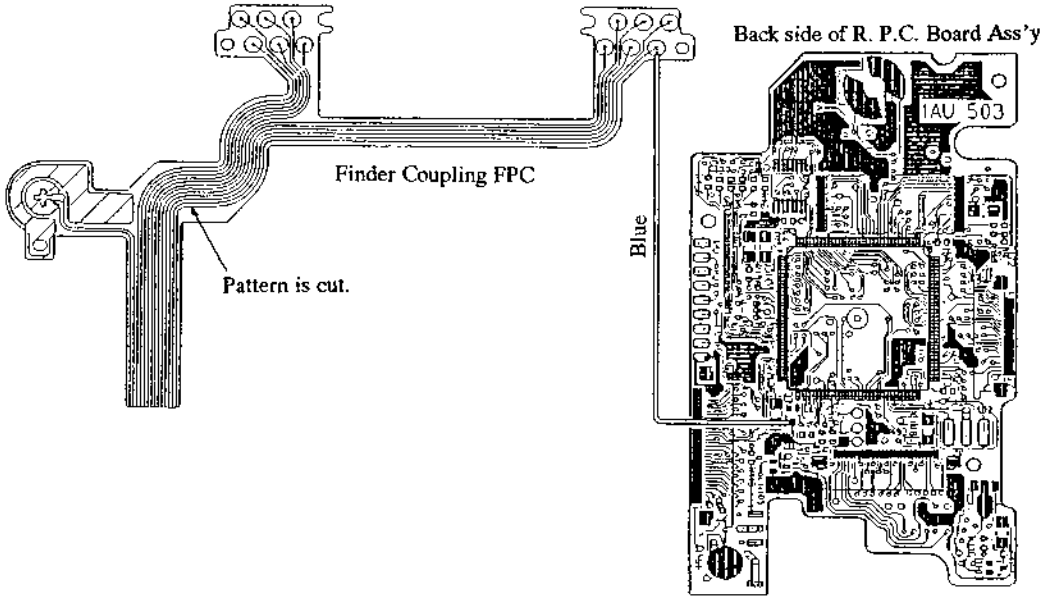
c) Repair Information :
   ① There is an interchangeability between the old type Main FPC Ass'y and the new type Main FPC Ass'y.
   ② Remove the Second Curtain P.C. Board and install the new Main FPC Ass'y in the Camera Body.

[4] Addition of Blue Lead Wire

In initial production, as a temporary measure for protection from electrostatic discharge (ESD), a Blue lead wire (from R. P.C. Board Ass'y to Finder Coupling FPC) was added. In the course of production, however, as the permanent measure, the R. P.C. Board Ass'y was improved and the Blue lead wire was disused.
This Service Manual describes the new type R. P.C. Board Ass'y.
The old type R. P.C. Board Ass'y will not be supplied, but only the new type R. P.C. Board Ass'y will be supplied.
Follow the repair procedures described below to repair the old type R. P.C. Board Ass'y.

a) Location of Blue lead wire :
   ① The Blue lead wire is led from the collector of the Transistor Q121 on the R. P.C. Board Ass'y to the contact pin on the Finder Coupling FPC.

b) Lead wire connection diagram :



c) Repair Information :
   ① There is an interchangeability between the old type R. P.C. Board Ass'y and the new type R. P.C. Board Ass'y.
   ② Remove the Blue lead wire and install the new R. P.C. Board Ass'y in the Camera Body.
   ③ Replace the Finder Coupling FPC Ass'y with a new one.

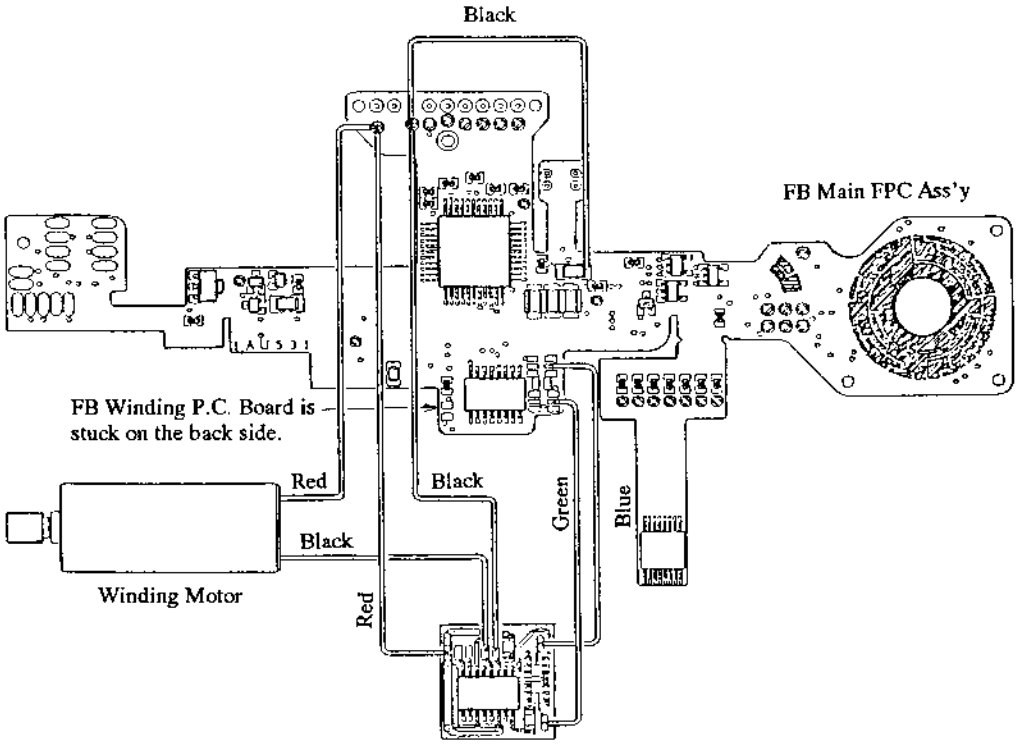
   Note :
   - Replace not only the old type R. P.C. Board Ass'y with the new type one but also replace the Finder Coupling FPC Ass'y with a new one.

[5] Addition of FB Winding P.C. Board

In initial production, as a temporary measure to improve winding performance at low temperature, the FB Winding P.C. Board was added. In the course of production, however, as the permanent measure, the FB Main FPC Ass'y was improved and the FB Winding P.C. Board was disused.
This Service Manual describes the new type FB Main FPC Ass'y.
The old type FB Main FPC Ass'y will not be supplied, but only the new type FB Main FPC Ass'y will be supplied.
Follow the repair procedures described below to repair the old type FB Main FPC Ass'y.

a) Location of FB Winding P.C. Board :
① The FB Winding P.C. Board is located on the bottom of the Film Box.

b) Lead wire connection diagram :



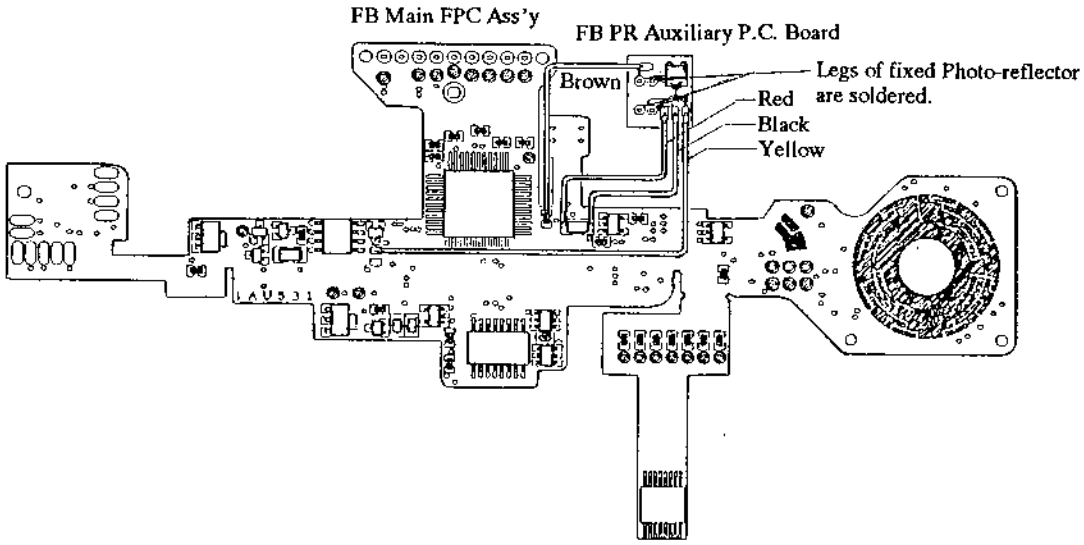
c) Repair Information :
① There is an interchangeability between the old type FB Main FPC Ass'y and the new type FB Main FPC Ass'y.
② Remove the FB Winding P.C. Board and install the new FB Main FPC Ass'y in the Film Box.
③ Solder the Blue lead wire of the Winding Motor in a way as shown on page C-29.

[6] Addition of FB PR Auxiliary P.C. Board

In initial production, as a temporary measure to improve bar code read-in accuracy, the FB PR Auxiliary P.C. Board was added. In the course of production, however, as the permanent measure, the FB Main FPC Ass'y was improved and the FB PR Auxiliary P.C. Board was disused.
This Service Manual describes the new type FB Main FPC Ass'y.
The old type FB Main FPC Ass'y will not be supplied, but only the new type FB Main FPC Ass'y will be supplied.
Follow the repair procedures described below to repair the old type FB Main FPC Ass'y.

a) Location of FB PR Auxiliary P.C. Board :
① The FB PR Auxiliary P.C. Board is located on the bottom of the Film Box.

b) Lead wire connection diagram :



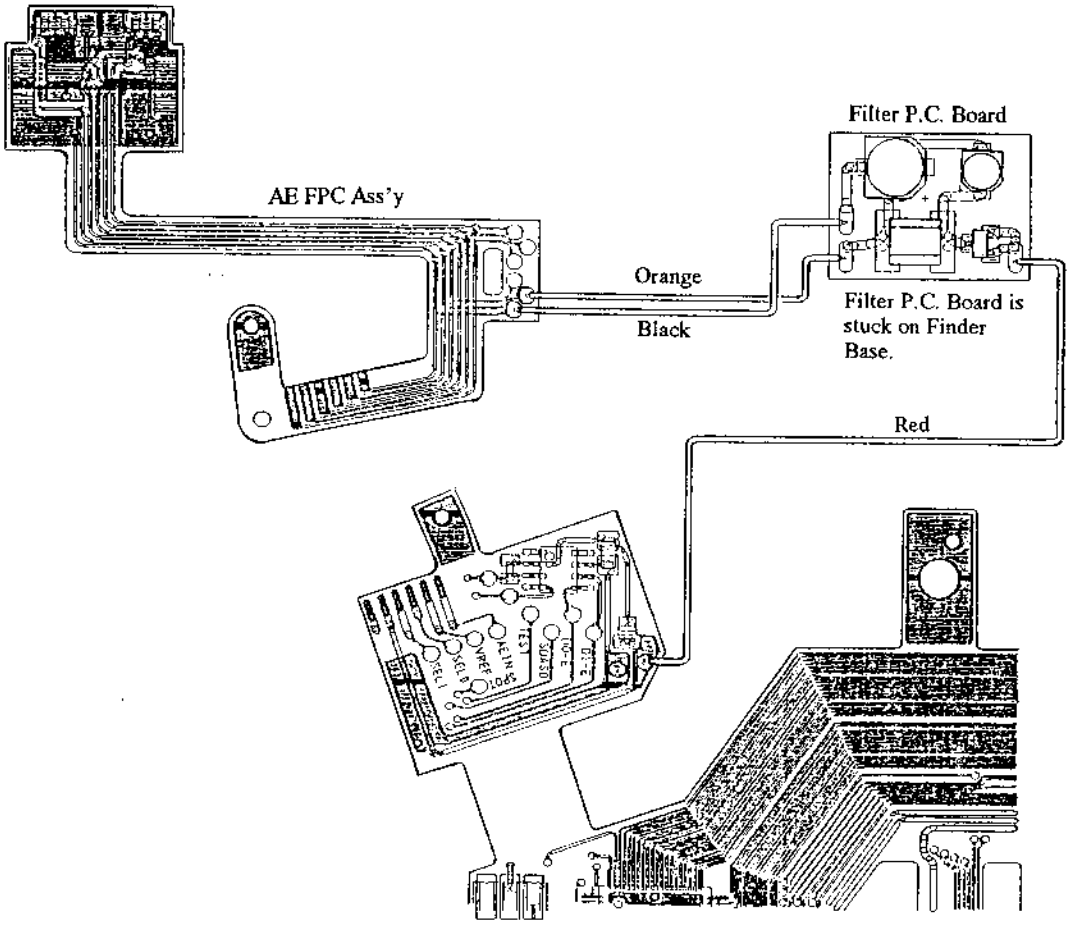
c) Repair Information :
① There is an interchangeability between the old type FB Main FPC Ass'y and the new type FB Main FPC Ass'y.
② Remove the FB PR Auxiliary P.C. Board and install the new FB Main FPC Ass'y in the Film Box.

[7] Addition of Filter P.C. Board

In initial production, as a temporary measure to improve light metering accuracy, the Flash P.C. Board was added. In the course of production, however, as the permanent measure, the Finder FPC Ass'y was improved and the Filter P.C. Board was disused.
This Service Manual describes the new type Finder FPC Ass'y.
The old type Finder FPC Ass'y will not be supplied, but only the new type Finder FPC Ass'y will be supplied.
Follow the repair procedures described below to repair the old type Finder FPC Ass'y.

a) Location of Filter P.C. Board :
① The Filter P.C. Board is fixed to the Finder Base with double-stick tape.

b) Lead wire connection diagram :



c) Repair Information :
① There is an interchangeability between the old type Finder FPC Ass'y and the new type Finder FPC Ass'y.
② Remove the Filter P.C. Board and install the new Finder FPC Ass'y in the AE Prism Finder.

C. ADJUSTMENT PROCEDURES, ETC.

C-1. ADJUSTMENTS OF COMPENSATION VALUES (MANUAL ADJUSTMENTS)

* This camera, when set in its own manual adjusting mode, permits checking and change of adjusted values concerning various operation adjustments as well as checking of internal data.
* Even in the manual adjusting mode, the normal camera operation is possible. Therefore, after changing an adjusted value, you can check to see if the new adjusted value is correct, without completing the manual adjusting mode.

Note :

- Depending on adjustment items, operation switches are required to perform special operations, different from the normal operations.

C-1-1. Description of Manual Adjusting Mode

1. Procedure for Setting of Manual Adjusting Mode

① Mount the Lens and AE Prism Finder and remove the Film Back.
② Set the exposure mode to "B" (Bulb).
③ Set the Main Switch Lever to "AEL".
④ Turn the Mid-roll Film Wind Switch "ON" and while keeping it "ON", depress the Shutter Release Button all the way to turn the Release Switch "ON".
On completion of transition to the manual adjusting mode, the viewfinder display will become as shown below.
⑤ Return the Main Switch Lever to "ON".

Notes :

- With the Film Back kept mounted on the camera body, transition to the manual adjusting mode is impossible.
- Mount the Lens and AE Prism Finder on the camera body before setting the manual adjusting mode.
- Do not mount the Lens when making the adjustments which do not require use of the Lens.
  The camera will not operate normally if the Lens or AE Prism Finder is mounted after setting the manual adjusting mode.
- After transition to the manual adjusting mode, never operate the camera in "Tv" mode. Such operation could rewrite the lens data.
  However, you may move the Exposure Mode Lever through the "Tv" position to change exposure mode.

2. Display in Manual Adjusting Mode

On transition to the manual adjusting mode, the viewfinder display changes as shown here:

Battery Warning Mark : Indicates as usual.
Exposure Counter : Indicates the selected adjustment item number. (Decimal notation)
Metering Mark : Indicates as usual.
Flash Mark : Indicates as usual.
Focusing Mark : Indicates as usual.
Aperture Value indicator : Indicates the adjusted value for the selected adjustment item. (Decimal notation)
Shutter Speed indicator : Indicates various internal data for the selected adjustment item. (Hexadecimal notation)
Exposure Meter : Indicates as usual.
M Mark : Indicates as usual.
FL Mark : Indicates as usual.
+ /– Mark : Indicates the sign of the adjusted value. Lights up to indicate the minus sign.

Note :

- Immediately after transition to the manual adjusting mode, the adjustment item "00" (writing in EEPROM) is automatically set.

3. How to Select an Adjustment Item

* Prior to changing an adjusted value, select the adjustment item for which the adjusted value is to be changed.

① Set the Main Switch Lever to "ON".
② To increment the adjustment item number
Set the Focus Dial to "SAF" and press the AF Lock Button.
Every time the AF Lock Button is pressed once, the adjustment item number is incremented by one.
③ To decrement the adjustment item number
Set the Focus Dial to "CAF" and press the AF Lock Button.
Every time the AF Lock Button is pressed once, the adjustment item number is decremented by one.

Notes :

- The adjustment item number will not lower below "00" and will not rise above "95".
- Adjustment items numbered "70s" are missing. Although display at these positions is not correct, such an incorrect display does not signify any abnormality.
- Keeping the AF Lock Button pressed will change the adjustment item rapidly.
- Set the Focus Dial to "MF" and press the AF Lock Button, and the adjustment item number will return to "00".
- When the Exposure Mode Select Lever passes the "Tv" to change the exposure mode, the adjustment item number will return to "00". At this point, never set the Exposure Mode Select Lever in the "Tv" position. You may move the Exposure Mode Lever through the "Tv" position.

4. How to Change an Adjusted Value

① Set the Main Switch Lever to "AEL".
② To increment the adjusted value
Set the Focus Dial to "SAF" and press the AF Lock Button.
Every time the AF Lock Button is pressed once, the adjusted value is incremented by one.
③ To decrement the adjusted value
Set the Focus Dial to "CAF" and press the AF Lock Button.
Every time the AF Lock Button is pressed once, the adjusted value is decremented by one.

Notes :

- The display for values below "– 99" is fixed to "– 99" and the display for values above "+ 99" is fixed to "+ 99". Internally, the values from "– 128" to "+ 127" can be stored, but display stops at ± 99.
- The digit "7" of adjustment item numbers "70s" is displayed as " ⊐ ".
- Keeping the AF Lock Button pressed will change the adjustment item rapidly.
- Set the Focus Dial to "MF" and press the AF Lock Button, and the adjusted value will be decremented.
- Operation at any item which has no adjusted value is invalid.
- Take care not to change the adjusted value for any wrong adjustment item.

5. How to Store Adjusted Value in Memory

The new adjusted value has not be written in EEPROM of the camera yet only by the operation of changing an adjusted value according to "4. How to Change an Adjusted Value" above. Store the new adjusted value in memory as follows :

① Set the Main Switch Lever to "ON".
② Set the Focus Dial to "MF" and press the AF Lock Button, and the adjustment item number will return to "00".
③ Depress the Shutter Release Button all the way to the Release Switch "ON", and the adjusted value will be written in EEPROM. At this point, the viewfinder display will blink for two seconds.

Notes :

- When the Release Switch is turned "ON", there may be a case where the shutter sequence is executed. However, such operation does not signify any abnormality.
- For average light metering, select adjustment item "58", since the adjusted value will be written in EEPROM inside the AE Prism Finder.

6. Completion of Manual Adjusting Mode

① Set the Main Switch "OFF". After that, turning the Main Switch "ON" will return the camera to the normal mode.

Notes :

- If the Main Switch is turned "OFF" without performing operation of "5. How to Store Adjusted Value in Memory", the changed adjusted value will be invalid and the adjusted value will not be updated.
- In the manual adjusting mode, Auto Power OFF does not occur. That is, the battery will be consumed if you do not turn the Main Switch "OFF". On completion of adjustments, be sure to turn the Main Switch "OFF".

General Notes on Manual Adjusting Mode

WARNING :

If you do not observe the following instructions, the camera may lose its function for normal operation and you may not be able to correct it in the manual adjusting mode.

Read the following instructions carefully and never fail to observe them:

① This manual describes only the adjustment items which are necessary for adjustments on service side. However, the adjusted values for adjustment items which are not covered by this manual also play important roles inside the camera.
Therefore, take great care not to select a wrong adjustment item or not to change the adjusted value for a wrong adjustment item selected by mistake.

② If an adjusted value for a wrong adjustment item has been changed, set the Main Switch to "OFF" before writing it in memory and start the adjustment procedure again. If a new adjusted value for a wrong adjustment item has been written in memory, you may not be able to correct it.

③ Take care, since depressing the Shutter Release Button all the way to the Release Switch "ON" at the adjustment item "57" will clear all the data from EEPROM of the camera body.

④ Take care, since depressing the Shutter Release Button all the way to the Release Switch "ON" at the adjustment item "61" will clear all the data from EEPROM of the AE Prism Finder mounted.

⑤ Take care, since depressing the Shutter Release Button all the way to the Release Switch "ON" at the adjustment item "90" will clear all the data from EEPROM of the Lens mounted.

⑥ Observe the instructions on each adjustment.

C-1-2. Adjustment Procedure

1. Temperature Adjustment (Adjustment Item 29)

* Adjust the temperature measuring circuit inside the camera body.

< Tools for Adjustment >

- Thermometer

< Adjustment Procedure >

1) Mount the AE Prism Finder.
2) Set the manual adjusting mode and select the adjustment item "29".
3) Of the four digits for shutter speed display, the superior-order two digits represent a temperature. The numerals are represented in hexadecimal notation. For example, 25℃ is displayed as "19".
4) Measure the current temperature with a thermometer and change the adjusted value so that the display in the camera represents the current temperature.
   Since a change in the adjusted value is followed by a change in the temperature display, change the adjusted value while watching the display.
5) Set the adjustment item to "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Note :

- Incrementing the adjusted value will decrement the number for temperature display.

Temperature	20	21	22	23	24	25	26	27	28	29	30
Display	14	15	16	17	18	19	1A	1B	1C	1D	1E

2. Adjustment of Shutter Dial Resistance (Adjustment Item 22)

* Adjust the setting of the Shutter Dial.

< Adjustment Procedure >

1) Mount the AE Prism Finder.
2) Set the manual adjusting mode and select the adjustment item "22".
3) Make certain that "1111" is displayed at the shutter speed display position in the viewfinder.
4) Set the Shutter Dial to "4000".
5) Depress the Shutter Release Button all the way to the Release Switch "ON".
6) Make certain that "2222" is displayed at the shutter speed display position in the viewfinder.
   If "EEEE" is displayed here, the setting is faulty.
7) Set the Shutter Dial to "8S".
8) Depress the Shutter Release Button all the way to the Release Switch "ON".
9) Make certain that "0000" is displayed at the shutter speed display position in the viewfinder.
   If "EEEE" is displayed here, the setting is faulty.
10) Return the Shutter Dial to "4000" and depress the Shutter Release Button all the way.
11) Make certain that "1111" is displayed at the shutter speed display position in the viewfinder.
12) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Make adjustment with the Shutter Dial set to the positions "4000" and "8S". Do not set the Shutter Dial to any other position by mistake. If you make an incorrect setting, "EEEE" is displayed.
- If "EEEE" is displayed, depress the Shutter Release Button all the way again, and the display will return to "1111", which is the initial display.
- When the Shutter Release Button is depressed all the way, there may be a case where the shutter sequence is executed. However, such operation does not signify any abnormality.

3. Adjustment of Exp. Compensation Dial Resistance (Adjustment Item 25)

* Adjust the setting of the Exp. Compensation Dial.

< Adjustment Procedure >

1) Mount the AE Prism Finder.
2) Set the manual adjusting mode and select the adjustment item "25".
3) Make certain that "1111" is displayed at the shutter speed display position in the viewfinder.
4) Set the Exp. Compensation Dial to "– 2".
5) Depress the Shutter Release Button all the way to the Release Switch "ON".
6) Make certain that "2222" is displayed at the shutter speed display position in the viewfinder. If "EEEE" is displayed here, the setting is faulty.
7) Set the Exposure Compensation Dial to "+ 2".
8) Depress the Shutter Release Button all the way to the Release Switch "ON".
9) Make certain that "0000" is displayed at the shutter speed display position in the viewfinder. If "EEEE" is displayed here, the setting is faulty.
10) In this state, depress the Shutter Release Button all the way again.
11) Make certain that "1111" is displayed at the shutter speed display position in the viewfinder.
12) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Make adjustment with the Exp. Compensation Dial set to the positions "– 2" and "+ 2". Do not set the Exp. Compensation Dial to any other position by mistake. If you make an incorrect setting, "EEEE" is displayed.
- If "EEEE" is displayed, depress the Shutter Release Button all the way again, and the display will return to "1111", which is the initial display.
- When the Shutter Release Button is depressed all the way, there may be a case where the shutter sequence is executed. However, such operation does not signify any abnormality.

4. Shutter Time Adjustment (Adjustment Item 01)

< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
  Light receiver for 6×4.5 focal plane shutter camera
- Planar F2.0/80 mm Lens

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the manual adjusting mode and select the adjustment item "01".
3) Set the exposure mode to "M" and set the Metering Switch Lever in the "center-weighted average light metering" position.
4) Set the aperture of the Lens to "F2" and the Focus Ring to the infinity position.
5) Set the Shutter Dial to "4000".
6) Set the camera on the multi camera tester.
7) Make the camera execute shutter sequence by depressing the Shutter Release Button all the way and measure the shutter time.
8) From the measured value of shutter time, calculate the adjusted value based on the following formula :

   Adjusted value = (244 μsec – measured value of shutter time) / 6.4 μsec

9) Input the adjusted value.
10) For confirmation, operate the shutter and check the shutter time. The target value is 0.244 msec.
11) When the checked shutter time is within the allowable range of the target value, set the adjustment item "00".
12) Depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Changing the adjusted value by one will change the shutter time by 6.4 μsec.
- The adjusted value can be changed in the range of "– 23" to "+ 86". If the calculation result exceeds this range, such a result signifies that the Shutter Unit is defective.
- When an adjusted value has already been input, return the adjusted value to "0" before measuring the shutter time, or without returning the adjusted value to "0", measure the shutter time and obtain the new adjusted value by adding the calculation result to or subtracting it from the current adjusted value.

Allowable Range of Shutter Time

Shutter Speed	+	Reference Value	–
X	9.24	8.62	8.04
8"	8284	8000	7727
4"	4141	4000	3863
2"	2070	2000	1931
1"	1035	1000	966
1/2	517.6	500	483.0
1/4	258.8	250	241.5
1/8	134.0	125	116.6
1/15	66.99	62.50	58.32
1/30	33.55	31.30	29.20
1/60	16.75	15.63	14.58
1/125	8.37	7.81	7.29
1/250	4.81	3.91	3.17
1/500	2.40	1.95	1.58
1/1000	1.21	0.98	0.80
1/2000	0.65	0.49	0.37
1/4000	0.383	0.244	0.155

(Unit : ms)

5. X Timing Adjustment (Adjustment Item 02)

* Adjust the timing of the X contact turning "ON" measured from the time of shutter opening. This camera, without using a mechanical contact as the X contact, controls an electronic switch by a microcomputer so as to turning the X contact "ON" at the time of shutter opening.

< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
  Light receiver for 6×4.5 focal plane shutter camera
- Planar F2.0/80 mm Lens

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the manual adjusting mode and select the adjustment item "02".
3) Set the exposure mode to "M" and set the Metering Switch Lever in the "center-weighted average light metering" position.
4) Set the aperture of the Lens to "F2" and the Focus Ring to the infinity position.
5) Set the Shutter Dial to "125".
6) Set the SH mode of the multi camera tester to "DELAY. T".
7) Set the camera on the multi camera tester and connect the synchro cord to the Synchro Terminal of the camera.
8) Operate the shutter and measure the X contact turning ON time.
   Check the indication at the Range A on the multi camera tester.

Indications on multi camera tester

Range A	0	mS	X contact turning ON time
Range B	. 500	mS	Fully opening time
Range C	. 500	mS	

9) From the measured value of time, calculate the adjusted value based on the following formula :

   Adjusted value = – 1 × (measured value of time/8 μsec)

10) Input the adjusted value.
11) For confirmation, operate the shutter and check the X contact turning ON time.

    Standard value : 0 msec or more

12) When the checked time meets the standard value, set the adjustment item "00".
13) Depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Changing the adjusted value by one will change the measured value of time by 8 μsec.
- The light receiver of the multi camera tester must be contained completely within the aperture of the camera.
- After adjustment, check the fully opening time measured from the X contact turning "ON". This time must be 0.500 msec or longer.
- When an adjusted value has already been input, return the adjusted value to "0" before taking a measurement, or without returning the adjusted value to "0", take a measurement and obtain the new adjusted value by adding the calculation result to or subtracting it from the current adjusted value.

6. CCD Adjustment (Adjustment Item 40)

* Once the Mount Base Ass'y has been replaced with a new one, make this CCD Adjustment.
* Adjust the adjusted values for CCD control (adjustment items 14 ~ 18 and 30 ~ 39) semiautomatically.

< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
- Planar F2.0/80 mm Lens

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the manual adjusting mode and select the adjustment item "40".
3) Set the Focus Ring of the camera to the infinity position.
4) Set the light source of the multi camera tester to "LV 15" and the K value to "1.3".

6-1. Semiautomatic Adjustment of Adjusted Value for Clip

① The viewfinder display is as follows :

② Set the Focus Dial to "M".

③ Depress the Shutter Release Button all the way to the Release Switch "ON".
Upon this, the camera will start adjusting automatically the adjusted value for clip. The adjustment will be completed at the end of shutter operation. "2222" will be displayed at the shutter speed display position in the viewfinder when the adjustment has been achieved successfully. The adjusted value for the adjustment item "14" will be changed automatically and then the camera will start "6-2. Semiautomatic Adjustment of Adjusted Value for Gain Clock".

* Several seconds may be required to complete the adjustment ; the passage of such several seconds without any change in the viewfinder display does not signify any abnormality.

④ If "EE**", instead of "2222", is displayed at the shutter speed display position, this display signifies that the camera has failed in the adjustment. In this case, depress the Shutter Release Button all the way again, and the viewfinder display will return to that at ① above. Then repeat the adjustment procedure.

6-2. Semiautomatic Adjustment of Adjusted Value for Gain Clock

① The viewfinder display is as follows :

② Set the Focus Dial to "M".

③ Depress the Shutter Release Button all the way to the Release Switch "ON".
Upon this, the camera will start adjusting automatically the adjusted value for gain clock. The adjustment will be completed at the end of shutter operation. "3333" will be displayed at the shutter speed display position in the viewfinder when the adjustment has been achieved successfully. The adjusted value for the adjustment item "15" will be changed automatically and then the camera will start "6-3. Semiautomatic Adjustment of Adjusted Value of Single Gain".

④ If "EE**", instead of "3333", is displayed at the shutter speed display position, this display signifies that the camera has failed in the adjustment. In this case, depress the Shutter Release Button all the way to again, and the viewfinder display will return to that at ① above. Then repeat the adjustment procedure.

6-3. Semiautomatic Adjustment of Adjusted Value of Single Gain

① The viewfinder display is as follows :

② Set the Focus Dial to "M".
③ Depress the Shutter Release Button all the way to the Release Switch "ON".
Upon this, the camera will start adjusting automatically the adjusted value for single gain. The adjustment will be completed at the end of shutter operation. "4444" will be displayed at the shutter speed display position in the viewfinder when the adjustment has been achieved successfully. The adjusted value for the adjustment item "16" will be changed automatically and then the camera will start "6-4. Semiautomatic Adjustment of Adjusted Value for Dark Output".
④ If "EE**", instead of "4444", is displayed at the shutter speed display position, this display signifies that the camera has failed in the adjustment. In this case, depress the Shutter Release Button all the way again, and the viewfinder display will return to that at ① above. Then repeat the adjustment procedure.

6-4. Semiautomatic Adjustment of Adjusted Value for Dark Output

① The viewfinder display is as follows :

② Remove the camera from the light source of the multi camera tester and cover the Lens with the Lens Cap to prevent light from entering through the Lens into the camera. Also cover the eyepiece with the eyepiece shutter to prevent light from entering through the viewfinder.
③ Set the Focus Dial to "M".
④ Depress the Shutter Release Button all the way to the Release Switch "ON".
Upon this, the camera will start adjusting automatically the adjusted value for dark output. The adjustment will be completed at the end of shutter operation. "5555" will be displayed at the shutter speed display position in the viewfinder when the adjustment has been achieved successfully. The adjusted values for the adjustment item "30" – "39" will be changed automatically and then the camera will start "6-5. Semiautomatic Adjustment of Adjusted Value for Double/Quadrupled Gain".
* Several seconds may be required to complete the adjustment ; the passage of such several seconds without any change in the viewfinder display does not signify any abnormality of the camera.
⑤ If "EE**", instead of "5555", is displayed at the shutter speed display position, this display signifies that the camera has failed in the adjustment. In this case, depress the Shutter Release Button all the way again, and the viewfinder display will return to that at ① above. Then repeat the adjustment procedure.

6-5. Semiautomatic Adjustment of Adjusted Value for Double/Quadrupled Gain

① The viewfinder display is as follows :

② Set the camera at the light source of the multi camera tester again. Set the light source to "LV 15" and the K value to "1.3".
③ Set the Focus Ring of the Lens to the infinity position.
④ Set the Focus Dial to "M".
⑤ Depress the Shutter Release Button all the way to the Release Switch "ON".
Upon this, the camera will start adjusting automatically the adjusted value for double/quadrupled gain. The adjustment will be completed at the end of shutter operation. "0000" will be displayed at the shutter speed display position in the viewfinder when the adjustment has been achieved successfully. The adjusted values for the adjustment item "17" and "18" will be changed automatically.
* Upon this, all the adjustments of adjusted values for CCD control have been completed.
⑥ If "EE**", instead of "0000", is displayed at the shutter speed display position, this display signifies that the camera has failed in the adjustment. In this case, depress the Shutter Release Button all the way again, and the viewfinder display will return to that at ① above. Then repeat the adjustment procedure.

6) On completion of all the operations above, set the adjustment item "00".
7) Depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted values in EEPROM.

7. Adjustment of Spot Light Metering (Adjustment Items 03 and 04)

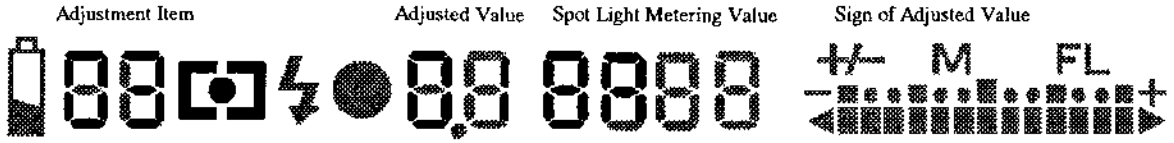
* Adjust the spot light metering executed by the camera body.

< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
  Light receiver for 6×4.5 focal plane shutter camera
- Planar F2.0/80 mm Lens

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the manual adjusting mode and select the adjustment item "03".
3) Set the aperture of the Lens to "F5.6" and the Focus Ring to the infinity position.
4) Set the Metering Switch Lever in the "spot light metering" position.
5) Set the light source of the multi camera tester to "LV 9" and the K value to "1.3".
6) Set the camera on the multi camera tester.
7) The viewfinder display will indicate the adjustment item, adjusted value and spot light metering value as shown below. The spot light metering value is represented in hexadecimal notation.



8) Change the adjusted value so that the spot light metering value at "LV 9" becomes "88" (hexadecimal notation). Incrementing the adjusted value will decrement the light metering value ; decrementing the adjusted value will increment the light metering value. Since changing the adjusted value will be followed by a corresponding change in the light metering value on the display, you can make adjustment while watching the display.
   In the example above, where the spot light metering value is "8A", the adjusted value must be incremented.
9) After successful adjustment of the light metering value to "88", return the Main Switch to the "ON" position and set the exposure mode to "Av" (Aperture-Priority AE) and the Focus Dial to "M".
10) Depress the Shutter Release Button all the way and measure the film plane exposure.
    Adjust so that the film plane exposure becomes nearly ± 0 EV.
    Notes :
    - For the purpose of measuring the film plane exposure, be sure to return the Main Switch to the "ON" position first and then operate the shutter.
    - Decrement the adjusted value when the film plane exposure is "+", while increment the adjusted value when the film plane exposure is "–".
      Changing the adjusted value by one will change the film plane exposure by 1/8 EV.
11) Set the light source of the multi camera tester to "LV 15" and the K value to "1.3".
12) Without completing the manual adjusting mode, set the adjustment item "04". Then in the same way as in the case of the adjustment item "03", the viewfinder display will indicate the adjustment item, adjusted value and spot light metering value.
13) Change the adjusted value so that the spot light metering value at "LV 15" becomes "b8" (hexadecimal notation). Incrementing the adjusted value will decrement the light metering value ; decrementing the adjusted value will increment the light metering value.
    In the example above, where the spot light metering value is "b6", the adjusted value must be decremented.
14) After successful adjustment of the light metering value to "b8", return the Main Switch to the "ON" position and set the exposure mode to "Av" (Aperture-Priority AE) and the Focus Dial to "M".
15) Depress the Shutter Release Button all the way and measure the film plane exposure.
    Adjust so that the film plane exposure becomes nearly ± 0 EV.
    Notes :
    - For the purpose of measuring the film plane exposure, be sure to return the Main Switch to the "ON" position first and then operate the shutter.
    - Decrement the adjusted value when the film plane exposure is "+", while increment the adjusted value when the film plane exposure is "–".
      Changing the adjusted value by one will change the film plane exposure by 1/8 EV.

16) On completion of the adjustment above, set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted values in EEPROM. Depressing the Shutter Release Button all the way at the adjustment item "00" will write the adjusted values in EEPROM of the camera body.
17) Make certain that the adjustments have been achieved correctly.

Set the light source to "LV 9" or "LV 15" and make certain that the film plane exposure in the "Av" mode is within ± 0.5 EV.

Note :

- Use the Planar F2.0/80 mm Lens and be sure to set the Focus Ring of the Lens to the infinity position.

Allowable Range of Film Plane Exposure

Brightness (LV)	Allowable Range
LV 9	– 0.5 ~ + 0.5 EV
LV 15	– 0.5 ~ + 0.5 EV

K value : 1.3

8. Adjustment of Center-weighted Average Light Metering (Adjustment Items 59 and 60)

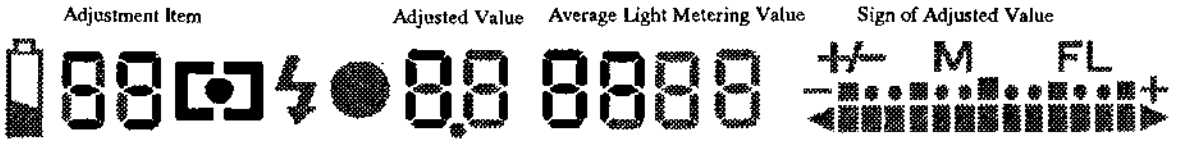
* Adjust the center-weighted average light metering executed by the AE Prism Finder.

< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
  Light receiver for focal plane shutter camera
- Planar F2.0/80 mm Lens

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the manual adjusting mode and select the adjustment item "59".
3) Set the aperture of the Lens to "F5.6" and the Focus Ring to the infinity position.
4) Set the Metering Switch Lever in the "center-weighted average light metering" position.
5) Set the light source of the multi camera tester to "LV 9" and the K value to "1.3".
6) Set the camera on the multi camera tester.
7) The viewfinder display will indicate the adjustment item, adjusted value and center-weighted average light metering value as shown below. The center-weighted average light metering value is represented in hexadecimal notation.



8) Change the adjusted value so that the center-weighted average light metering value at "LV 9" becomes "88" (hexadecimal notation). Incrementing the adjusted value will decrement the light metering value ; decrementing the adjusted value will increment the light metering value. Since changing the adjusted value will be followed by a corresponding change in the light metering value on the display, you can make adjustment while watching the display.
   In the example above, where the center-weighted average light metering value is "8A", the adjusted value must be incremented.
9) After successful adjustment of the light metering value to "88", return the Main Switch to the "ON" position and set the exposure mode to "Av" (Aperture-Priority AE) and the Focus Dial to "M".
10) Depress the Shutter Release Button all the way and measure the film plane exposure.
    Adjust so that the film plane exposure becomes nearly ± 0 EV.

Notes :

- For the purpose of measuring the film plane exposure, be sure to return the Main Switch to the "ON" position first and then operate the shutter.
- Decrement the adjusted value when the film plane exposure is "+", while increment the adjusted value when the film plane exposure is "–".
  Changing the adjusted value by one will change the film plane exposure by 1/8 EV.

11) Set the light source of the multi camera tester to "LV 15".
12) Without completing the manual adjusting mode, set the adjustment item "60". Then in the same way as in the case of the adjustment item "59", the viewfinder display will indicate the adjustment item, adjusted value and center-weighted average light metering value.
13) Change the adjusted value so that the center-weighted average light metering value at "LV 15" becomes "b8" (hexadecimal notation). Incrementing the adjusted value will decrement the light metering value ; decrementing the adjusted value will increment the light metering value.
    In the example above, where the center-weighted average light metering light metering value displayed is "b6", the adjusted value must be decremented.
14) After successful adjustment of the light metering value to "b8", return the Main Switch to the "ON" position and set the exposure mode to "Av" (Aperture-Priority AE) and the Focus Dial to "M".
15) Depress the Shutter Release Button all the way and measure the film plane exposure.
    Adjust so that the film plane exposure becomes nearly ± 0 EV.

Notes :

- For the purpose of measuring the film plane exposure, be sure to return the Main Switch to the "ON" position first and then operate the shutter.
- Decrement the adjusted value when the film plane exposure is "+", while increment the adjusted value when the film plane exposure is "–".
  Changing the adjusted value by one will change the film plane exposure by 1/8 EV.

16) Set the adjustment item "58" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted values in EEPROM. Depressing the Shutter Release Button all the way at the adjustment item "58" will write the adjusted values in EEPROM of the AE Prism Finder.
17) Make certain that the adjustments have been achieved correctly.

    Set the light source to "LV 9" or "LV 15" and make certain that the film plane exposure in the "Av" mode is within ± 0.5 EV.

Notes :

- In this adjustment, the adjusted values are to be written in AE Prism Finder. Therefore, depress the Shutter Release Button all the way to the Release Switch "ON" at the adjustment item "58".
  Take care not to depress the Shutter Release Button all the way to the Release Switch "ON" at the adjustment item "00".
- The adjustment items to be used in this adjustment are "58", "59" and "60". ***The nearby adjustment items "57" and "61" function to clear EEPROM of all the data. Never depress the Shutter Release Button all the way to the Release Switch "ON" at either of these adjustment items.***
- During adjustment, do not remove the AE Prism Finder. If you remove it by mistake, turn OFF the Main Switch of the camera once, mount the AE Prism Finder again and set the manual adjusting mode.
- Use the Planar F2.0/80 mm Lens and be sure to set the Focus Ring of the Lens to the infinity position.

9. Adjustment of TTL Direct Flash Metering (Adjustment Item 07)

* Adjust the TTL Flash Auto Control level for TTL Direct Flash Metering.

9-1. Adjustment Using Flash Meter

< Tools for Adjustment >

- Flash meter
- Planar F2.0/80 mm Lens
- TLA flash unit
- Standard reflector paper (reflectivity : 18 %)
- Tripod
- Film of ISO 100

< Adjustment Procedure >

1) Mount the AE Prism Finder, Lens and TLA flash unit.
2) Set the aperture of the Lens to "F4" and the Focus Ring to the "2 m" position.
3) Set the exposure mode to "M".
4) Set the Shutter Dial to "1/60" and the Exposure Compensation Dial to "0".
5) Load a roll of ISO 100 film.
6) Set the camera at 2 m from the standard reflector paper.
7) Make certain that the flash has been charged fully, and then depress the Shutter Release Button all the way to execute the shutter sequence.
8) At the same time, measure the flash variance (ΔEV) with a flash meter.
9) From the flash variance, calculate the adjusted value based on the following formula :

   Adjusted value = – (flash variance / 0.33)

   [Example]

   Flash variance : 0.65 EV → Adjusted value = – (0.65/0.3) = – 1.97 = – 2
   As the adjusted value, "– 2" is obtained by rounding off the decimals.

10) Set the manual adjusting mode and select the adjustment item "07".
11) Input the adjusted value obtained by calculation.
12) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.
13) Complete the manual adjusting mode and repeat steps 7) to 10) to make certain that the adjustment has been achieved correctly.

9-2. Adjustment by Actual Picture Taking

< Tools for Adjustment >

- Planar F2.0/80 mm Lens
- TLA flash unit
- Standard reflector paper (reflectivity : 18 %)
- Tripod
- Film of ISO 100

< Adjustment Procedure >

1) Set the exposure mode to "Av" and take pictures of a desired subject under desired conditions of camera-to-subject distance, aperture, etc.
2) In doing so, change the position of the Exposure Compensation Dial in 1/3 step increments in the range of – 2 to + 2 and take a picture in each position.
3) Check the pictures taken and determine the most favorable position of the Exposure Compensation Dial.
4) The relationship between the positions of the Exposure Compensation Dial and the adjusted values is as follows :

Dial	Adjusted Value
– 2	– 6
– 1 2/3	– 5
– 1 1/3	– 4
– 1	– 3
– 2/3	– 2
– 1/3	– 1
0	0
+ 1/3	+ 1
+ 2/3	+ 2
+ 1	+ 3
+ 1 1/3	+ 4
+ 1 2/3	+ 5
+ 2	+ 6

5) Set the manual adjusting mode and select the adjustment item "07".
6) Input the adjusted value obtained by calculation.
7) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Before firing the flash, make certain that the flash has been charged fully.
- Set the Film ISO Dial to the "ISO 100" position correctly.
- Operate the shutter at a shutter speed (X or slower) which permits correct synchronization.
- When an adjusted value has already been input, return the adjusted value to "0" before taking a measurement, or without returning the adjusted value to "0", take a measurement and obtain the new adjusted value by adding the calculation result to or subtracting it from the current adjusted value.
- For this adjustment, operate the camera without setting the manual adjusting mode. Set the manual adjusting mode only when inputting the adjusted value.
- Remove the Film Back before setting the manual adjusting mode.
- The adjusted value ranges from "– 3" to "+ 5".

10. Flashmeter Amount-of-Flash Adjustment (Adjustment Item 08)

* Adjust the amount of flash controlled by Flashmeter.

10-1. Adjustment Using Flash Meter

< Tools for Adjustment >

- Flash meter
- Planar F2.0/80 mm Lens
- TLA flash unit
- Standard reflector paper (reflectivity : 18 %)
- Tripod
- Film of ISO 100

< Adjustment Procedure >

1) Mount the AE Prism Finder, Lens and TLA flash unit.
2) Set the aperture of the Lens to "F4" and the Focus Ring to the "2 m" position.
3) Set the exposure mode to "M".
4) Set the Shutter Dial to "1/60" and the Exposure Compensation Dial to "0".
5) Load a roll of ISO 100 film.
6) Set the camera at 2 m from the standard reflector paper.
7) Make certain that the flash has been charged fully, and then set the Pre-Flash Lever to the "ON" position.
8) At the same time, measure the flash variance (ΔEV) with a flash meter.
9) From the flash variance, calculate the adjusted value using the following formula :

   Adjusted value = – (flash variance / 0.33)

   〔Example〕

   Flash variance : 0.65 EV → Adjusted value = – (0.65/0.3) = – 1.97 = – 2
   As the adjusted value, "– 2" is obtained by rounding off the decimals.

10) Set the manual adjusting mode and select the adjustment item "08".
11) Input the adjusted value obtained by calculation.
12) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.
13) Complete the manual adjusting mode and operate the Flashmeter again to make certain that the adjustment has been achieved correctly.

10-2. Adjustment by Actual Picture Taking

< Tools for Adjustment >

- Planar F2.0/80 mm Lens
- TLA flash unit
- Standard reflector paper (reflectivity : 18 %)
- Tripod
- Film of ISO 100

< Adjustment Procedure >

1) Set the exposure mode to "Av" and take pictures of a desired subject under desired conditions of camera-to-subject distance, aperture, etc.
2) In doing so, change the position of the Exposure Compensation Dial in 1/3 step increments in the range of – 2 to + 2 and take a picture in each position.
3) Picture taking procedure is as follows :
   ① Set the Pre-Flash Lever to the "ON" position to fire the flash. This operation will not operate the shutter.
   ② With the Pre-Flash Lever kept in the "ON" position, wait until the flash is fully charged and then depress the Shutter Release Button all the way to take a picture.
   ③ Return the Pre-Flash Lever to the original position.
   ④ Set the Exposure Compensation Dial to the next position and repeat the steps from ① above.
4) Check the pictures taken and determine the most favorable position of the Exposure Compensation Dial.
5) The relationship between the positions of the Exposure Compensation Dial and the adjusted values is as follows :

Dial	Adjusted Value
– 2	– 6
– 1 2/3	– 5
– 1 1/3	– 4
– 1	– 3
– 2/3	– 2
– 1/3	– 1
0	0
+ 1/3	+ 1
+ 2/3	+ 2
+ 1	+ 3
+ 1 1/3	+ 4
+ 1 2/3	+ 5
+ 2	+ 6

6) Set the manual adjusting mode and select the adjustment item "08".
7) Input the adjusted value obtained by calculation.
8) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Before firing the flash, make certain that the flash has been charged fully.
- Set the Film ISO Dial to the "ISO 100" position correctly.
- Operate the shutter at a shutter speed (X or slower) which permits correct synchronization.
- When an adjusted value has already been input, return the adjusted value to "0" before taking a measurement, or without returning the adjusted value to "0", take a measurement and obtain the new adjusted value by adding the calculation result to or subtracting it from the current adjusted value.
- For this adjustment, operate the camera without setting the manual adjusting mode. Set the manual adjusting mode only when inputting the adjusted value.
- Remove the Film Back before setting the manual adjusting mode.
- The adjusted value ranges from "– 3" to "+ 5".

11. Flashmeter Indication Adjustment (Adjustment Item 09)

* Adjust so that the correct amount of flash obtained as the result of "Flashmeter Amount-of-Flash Adjustment" above is displayed correctly on the Flashmeter indicator in the viewfinder.
* Complete the "Flashmeter Amount-of-Flash Adjustment" before making this adjustment.

< Tools for Adjustment >

- Flash meter
- Planar F2.0/80 mm Lens
- TLA flash unit
- Standard reflector paper (reflectivity : 18 %)
- Tripod

< Adjustment Procedure >

1) Mount the AE Prism Finder, Lens and TLA flash unit.
2) Set the manual adjusting mode and select the adjustment item "09".
3) Set the aperture of the Lens to "F4" and the Focus Ring to the "2 m" position.
4) Set the exposure mode to "M".
5) Set the Shutter Dial to "1/60" and the Exposure Compensation Dial to "0".
6) Load a roll of ISO 100 film.
7) Make certain that the flash has been charged fully, and then set the Pre-Flash Lever to the "ON" position to fire the flash.
8) The four digits at the shutter speed display position in the viewfinder indicate the flash variance at that time in hexadecimal notation.
9) From the indicated value of flash variance, calculate the adjusted value as follows :
   ① Convert the hexadecimal number to the decimal number. Since the number is represented in complement form, a hexadecimal number displayed with "F" at the fourth digit is a negative number.

[Example]	Display		Decimal number
	01BD	→	445
	003F	→	63
	FF67	→	– 153
	FEAA	→	– 342

   ② After conversion, divide the decimal number by 256. The resultant value represents the variance ΔEV.

[Example]	Decimal number		Variance
	445	→	1.738
	63	→	0.246
	– 153	→	– 0.598
	– 342	→	– 1.336

   ③ Convert the variance to the adjusted value using the following formula :

   Adjusted value = – (Variance / 0.005512)

[Example]	Variance	Adjusted value
	0.246	– 45
	– 0.533	+ 97

10) Input the adjusted value obtained by calculation.
11) Return the Pre-Flash Lever to the original position. And set the Pre-Flash Lever to the "ON" position again to make certain that the adjustment has been achieved correctly. In doing so, there is no need to complete the manual adjusting mode.
12) Set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

Notes :

- Before firing the flash, make certain that the flash has been charged fully.
- Be sure to complete the amount-of- flash adjustment before starting this adjustment. Also use the same setting conditions as used in the amount-of- flash adjustment.
- When an adjusted value has already been input, return the adjusted value to "0" before taking a measurement, or without returning the adjusted value to "0", take a measurement and obtain the new adjusted value by adding the calculation result to or subtracting it from the current adjusted value.

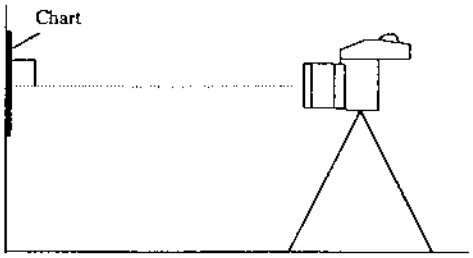
12. AF Adjustments (Adjustment Items 10, 11 and 12)

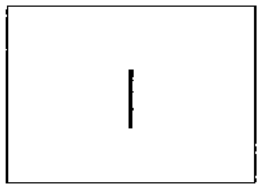
< Tools for Adjustment >

- Multi camera tester (EF-8000 or EF-5000)
- Planar F2.0/80 mm Lens
- AF chart
- Tripod

< Adjustment Procedure >

1) Mount the AE Prism Finder and Lens.
2) Set the aperture of the Lens to "F2".
3) Fix the AF chart on a wall or the like.
4) Mount the camera on a tripod in such a position that its optical axis is perpendicular to the AF chart plane.



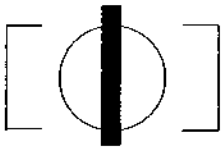


AF chart for central area adjustment

AF chart for right/left area adjustment

12-1. AF Adjustment for Central Area

1) As shown, position the camera steadily so that the vertical line chart is seen at the center of the focus frame.



2) Set the adjustment item "10".
3) While looking through the viewfinder, turn the focus ring of the Lens and focus the lens on the chart sharply.
   Note :
   - At this point, if viewfinder focusing is not correct, auto focusing of the lens can not be adjusted correctly.
4) The viewfinder display will indicate the adjustment item, adjusted value and defocus value (AF arithmetic operation value) as follows :

5) By changing the adjusted value, adjust so that the defocus value becomes nearly "0000".
   The defocus value is displayed in hexadecimal notation (two's-complement form). Therefore, a negative number is displayed in the form of "F___" as shown below.
   Incrementing the adjusted value will decrement the defocus value : decrementing the adjusted value will increment the defocus value.
   The defocus value varies slightly. Adjust so that the center of variation becomes nearly "0000".

Decimal number	−7	−6	−5	−4	−3	−2	−1	0	+1	+2	+3	+4	+5	+6	+7
Hexadecimal number	FFF8	FFF9	FFFA	FFFB	FFFC	FFFE	FFFF	0000	0001	0002	0003	0004	0005	0006	0007

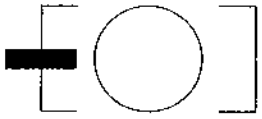
6) On completion of the adjustment, set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

12-2. AF Adjustment for Left Area
(Same adjustment as for central area except for chart and adjustment item)

1) As shown below, position the camera steadily so that the horizontal line chart is seen at the left side of the focus frame.
2) Set the manual adjusting mode and select the adjustment item "11".
3) While looking through the viewfinder, turn the focus ring of the Lens and focus the lens on the chart sharply.
4) By changing the adjusted value, adjust so that the defocus value becomes nearly "0000".
5) On completion of the adjustment, set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.

12-3. AF Adjustment for Right Area
(Same adjustment as for central area except for chart and adjustment item)

1) As shown below, position the camera steadily so that the horizontal line chart is seen at the right side of the focus frame.
2) Set the manual adjusting mode and select the adjustment item "12".
3) While looking through the viewfinder, turn the focus ring of the Lens and focus the lens on the chart correctly.
4) By changing the adjusted value, adjust so that the defocus value becomes nearly "0000".
5) On completion of the adjustment, set the adjustment item "00" and depress the Shutter Release Button all the way to the Release Switch "ON" to write the adjusted value in EEPROM.


At adjustment for left area

At adjustment for right area

Notes :

- ***Make the flange back adjustment and viewfinder focusing adjustment before making the AF adjustments.***
- Take care that no line of the chart is seen in any area other than the area under adjustment.
- The adjusted values can be written in EEPROM even after completion of all the adjustments for central, left and right areas.

C-1-3. Checking of Shots Counter (Adjustment Item 41)

* You can check the number of times the shutter has been operated. The counter can be cleared to zero.

1) Set the manual adjusting mode and select the adjustment item "41".
2) The number of times the shutter sequence has been executed up to now is indicated in six digits at the two-digit Aperture Value display position and the four-digit Shutter Speed display position in the viewfinder.
3) The display at the Aperture Value display position is represented in decimal notation, while the display at the Shutter Speed display position is in hexadecimal notation.

Notes :

- The digits at the Shutter Speed display position can represent the number of times up to 65535.
- To convert the display to the decimal number, multiply the number indicated in two digits at the Aperture Value display position by 65536, convert the superior-order 2-digit number at the Shutter Speed display position to the decimal number and multiply it by 256, convert the inferior-order 2-digit number at the Shutter Speed display position to the decimal number, and add all the three resultant numbers together.

  [Example 1] Display : 003FA1

  $(0 \times 65536) + (63 \times 256) + 161 = 16289$ times

  [Example 2] Display : 01FFDD

  $(1 \times 65536) + (255 \times 256) + 221 = 131037$ times

- Depressing the Shutter Release Button all the way to the Release Switch "ON" will clear the counter to zero. Do not depress the Shutter Release Button all the way to the Release Switch "ON" thoughtlessly.

C-1-4. Checking of Error Code (Adjustment Item 42)

* You can check the record of errors the camera has developed. The record of errors can be cleared to zero.

1) Set the manual adjusting mode and select the adjustment item "42".
2) An error code is displayed at the Aperture Value display position in the viewfinder.
3) To identify errors which have occurred, convert the displayed number (decimal notation) to the binary number and use the following relationship between the bits and errors :

Bit 0 (most superior-order)	: Mirror up error
Bit 1	: Mirror down error
Bit 2	: Charge error
Bit 3	: Shutter error
Bit 4	: Lens communication handshake error
Bit 5	: Lens communication serial error
Bit 6	: Finder communication handshake error
Bit 7 (most inferior-order)	: Finder communication serial error

[Example] 45 → 00101101
Mirror up, charge, shutter and lens serial errors occurred in the past.

Notes :

- The display shows the record of the errors which occurred in the past. It does not always show that such errors are occurring even now.
- Depressing the Shutter Release Button all the way to the Release Switch "ON" will clear the record to zero. Do not depress the Shutter Release Button all the way to the Release Switch "ON" thoughtlessly.

C-1-5. Setting of Custom Functions

* Perform the setting of custom functions in the manual adjusting mode where the adjusted values of the camera are to be changed.

< Preparation >

1) Mount the AE Prism Finder on the camera body.
2) Remove the Film Back, if mounted.
3) Remove the Lens, if mounted.

< Setting of Manual Adjusting Mode >

1) Set the Exposure Mode Select Lever to "B" (Bulb).
2) Set the Main Switch to "AEL" and while pressing the Mid-roll Film Wind Button, depress the Shutter Release Button all the way to the Release Switch "ON"
3) On completion of transition to the manual adjusting mode, the viewfinder display will become as shown below.
4) Return the Main Switch to the "ON" position.

< Custom function Change Item >

① Set the Focus Dial to "SAF" and press the Focus Button. Each press of the Focus Button will increment the item number by one.

② Set the Focus Dial to "CAF" and press the Focus Button. Each press of the Focus Button will decrement the item number by one.

③ In operation at ① or ②, keeping the Focus Button pressed will continuously increment or decrement the item number.

④ By operation at ①, ② and/or ③, set the adjustment item "67".

< Change of Setting Value for Custom Functions >

① Calculate the setting value for custom functions from the following formula :

Setting value = A + (B × 2) + (C × 4) + (D × 8) + (E × 16)

In this formula, substitute the following values :

• To set exposure order in A.B.C. mode	to standard	→ A = 0,	to custom	→ A = 1
• To set AEL by Check Switch	to "OFF"	→ B = 0,	to "ON"	→ B = 1
• To select as AF area	whole area	→ C = 0,	only center	→ C = 1
• To let spot brightness out-of-range warning be	presence	→ D = 0,	absence	→ D = 1
• To set spot brightness out-of-range warning width	to LV 3 ~ 18	→ E = 0,	to LV 4~ 17	→ E = 1

〔Example〕 To exposure order in A.B.C. mode to "custom" and to select "only center" as the AF area : A = 1, C = 1, and B, D and E = 0. Therefore,

Setting value = 1 + (0 × 2) + (1 × 4) + (0 × 8) + (0 × 16) = 5

② Set the Main Switch to "AEL".

③ Set the Focus Dial to "SAF" and press the Focus Button. Each press of the Focus Button will increment the setting value by one.

④ Set the Focus Dial to "CAF" and press the Focus Button. Each press of the Focus Button will decrement the setting value by one.

⑤ In operation at ① or ②, keeping the Focus Button pressed will continuously increment or decrement the setting value.

⑥ By operation at ①, ② and/or ③, set the setting value to the value obtained by calculation above.

< Writing of Changed Setting Value in Camera >

Notes :

- By operation described below, not only the setting value for custom functions but also the other adjusted values will be written all together.
  When only the setting value for custom functions is to be changed, never change the setting value for any adjustment item other than the adjustment item "67".
  If there is a possibility that the setting value for any other adjustment item has been changed by mistake, turn the Main Switch "OFF" once, and start the changing procedure from the first step and change the setting value for the adjustment item "67". After that, perform the following operation.

① Return the Main Switch to the "ON" position.
② Set the Focus Dial to "M" and press the Focus Button, and the adjustment item will return to "00".

③ Depress the Shutter Release Button all the way to the Release Switch "ON", and the camera will write the setting value.
The display will blink at 2 Hz for two seconds to indicate the execution of writing.

< Return to Normal Mode >

The change in setting of custom functions is completed with the writing of the changed setting value in the camera.
After completion of the change procedure, turn the Main Switch "OFF" once or unload the battery once to return the normal mode.

C-2. OTHERS

C-2-1. Flange Back Distance

- Distance from the Body Mount surface to the reference surface on the Camera Body for mounting the Film Back :

  59.80 ± 0.02 mm

- Distance from the Film Back reference surface to the film rail surface :

  4.35 ± 0.02 mm (120 surface)

- Distance between the film rail surface and the pressure plate rail surface :

  0.4 ± 0.02 mm (120 surface)

C-2-2. Adjustment of Viewfinder Focusing

* For adjustment, replace the Focus Adjusting Plates under the FS Holder Plates.

① If focusing is not achieved even when the focus ring is turned to the infinity position
⇒ The finder back distance is too long, so shorten (lower) the position of the focusing plate.

② If focusing occurs before the focus ring is turned to the infinity position
⇒ The finder back distance is too short, so lengthen (raise) the position of the focusing plate.

Parts No.	Description	Thickness (mm)
1AU76900	Focus Adjusting Plate	t : 0.2
1AU77400	Focus Adjusting Plate	t : 0.1
1AU77500	Focus Adjusting Plate	t : 0.05

C-2-3. Contact Efficiency

- The contact efficiency must be 60% or above at shutter speed of X or slower.

* Use a contact efficiency meter at 1 ms.

C-2-4. Shutter Curtain Travel Speed

- The travel speeds of the Shutter first curtain and Shutter second curtain are both such that each curtain takes about 7.3 ms to travel the vertical length of 41 mm.

* The curtain travel speed can not be adjusted. Therefore, replace the Shutter Unit with a new one if the travel speed of each curtain is significantly different from the specified value.

C-2-5. Standby Current

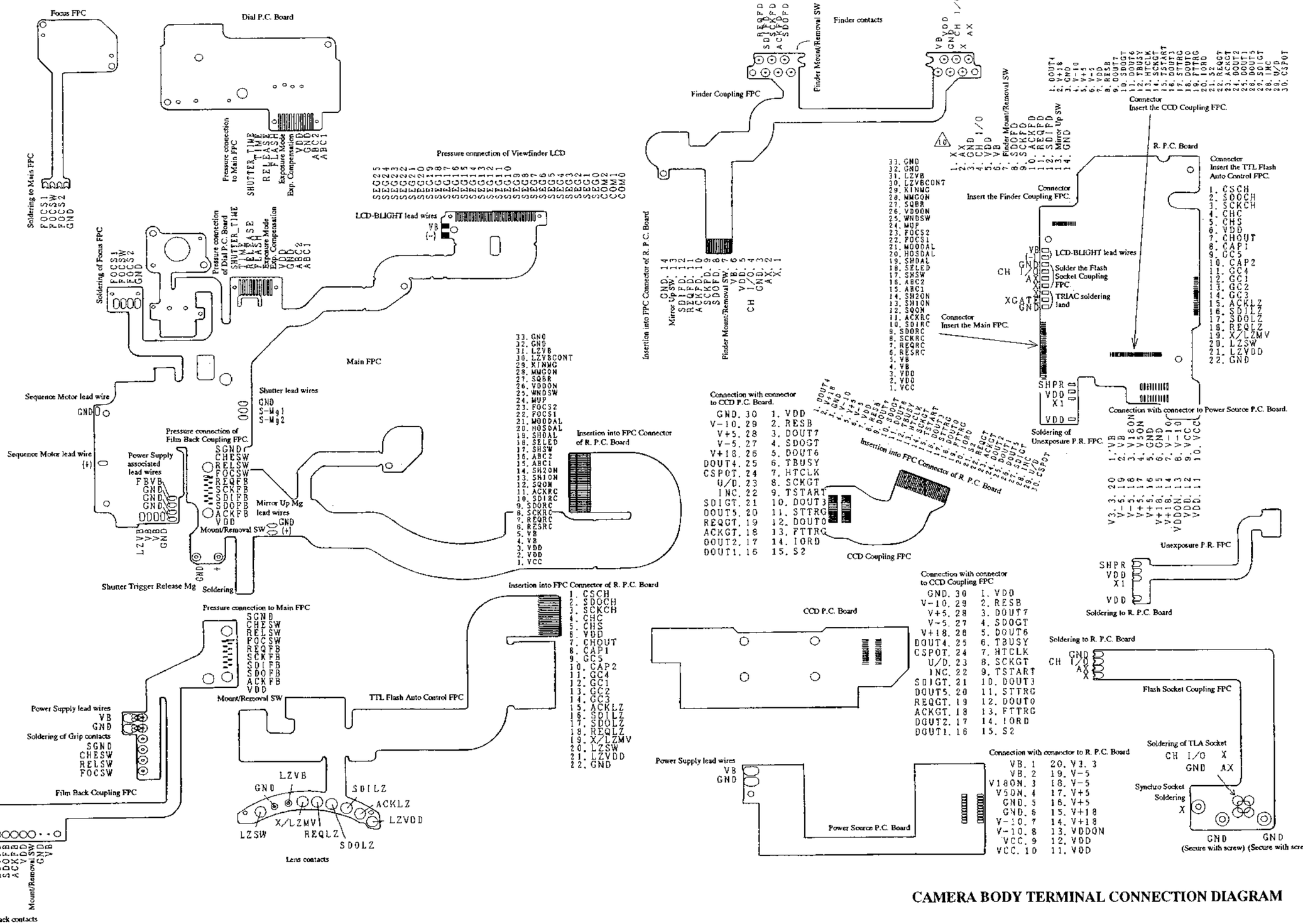
- Main Switch OFF 20 μA or below

[Notes on Measurement with Contact Efficiency / Insulation Resistance Meter]

* Switching for flash firing is performed by a TRIAC. The performance of this TRIAC can be deteriorated by a spark which can occur at connecting or disconnecting the connector of the insulation resistance meter to or from the flash socket.
  To prevent such deterioration, follow the following procedure when the contact efficiency / insulation resistance meter is to be used for measurement after completion of assembly of the camera.

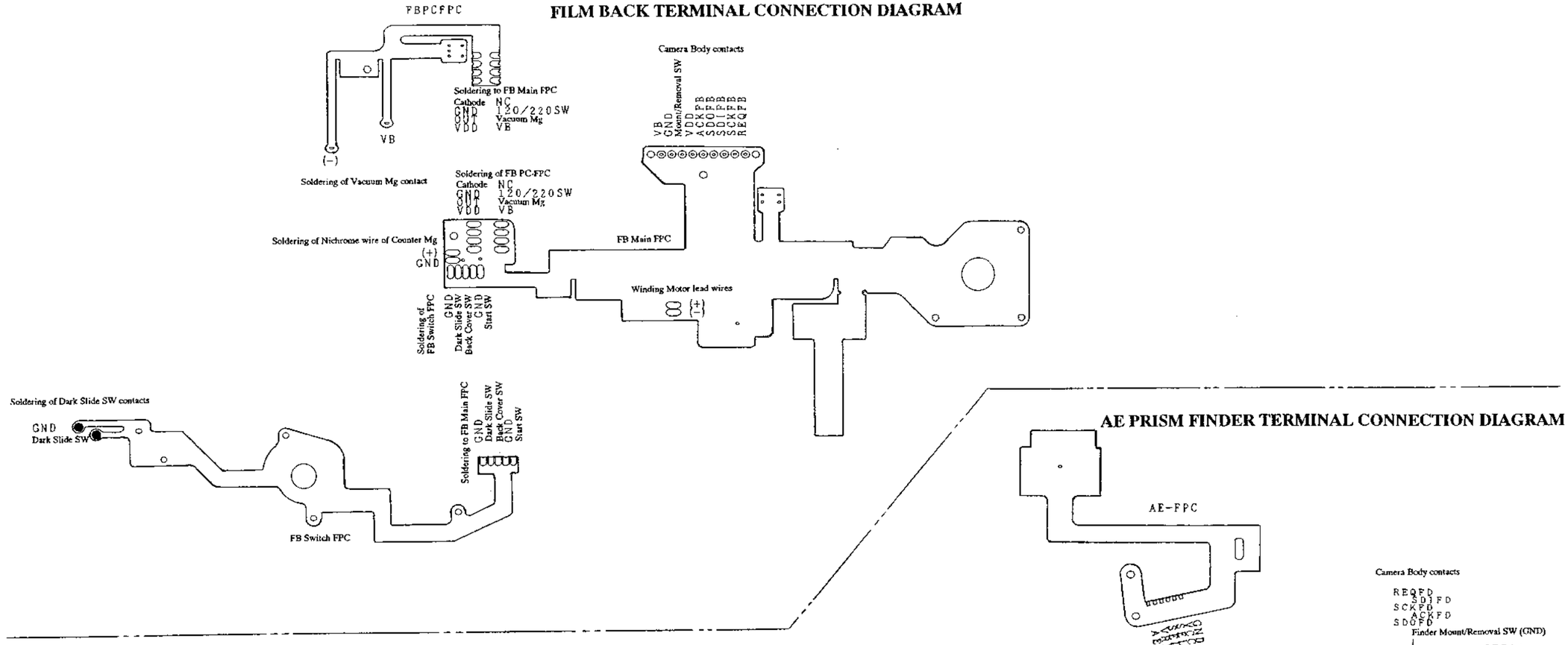
  ① Set the insulation resistance / contact efficiency select switch to "contact efficiency measurement".
  ↓
  ② Insert the plug of the insulation resistance meter into the socket of the camera securely.
  ↓
  ③ Operate the shutter and measure the contact efficiency. (Checking of the meter)
  ↓
  ④ Set the insulation resistance / contact efficiency select switch to "insulation resistance measurement".
  ↓
  ⑤ Check the insulation resistance, using the meter.
  ↓
  ⑥ Set the insulation resistance / contact efficiency select switch to "contact efficiency measurement".
  ↓
  ⑦ Pull the plug of the insulation resistance meter out of the socket of the camera.

* Take great care not to connect or disconnect the plug of the meter to or from the camera with the insulation resistance / contact efficiency select switch set in the "insulation resistance measurement" position. (In this state, the plug of the insulation resistance meter is always alive at a voltage of about 520 V. As a result, a spark can occur where the terminals of the plug come very close to the terminals of the socket when inserting or disconnecting the plug into or from the socket.)

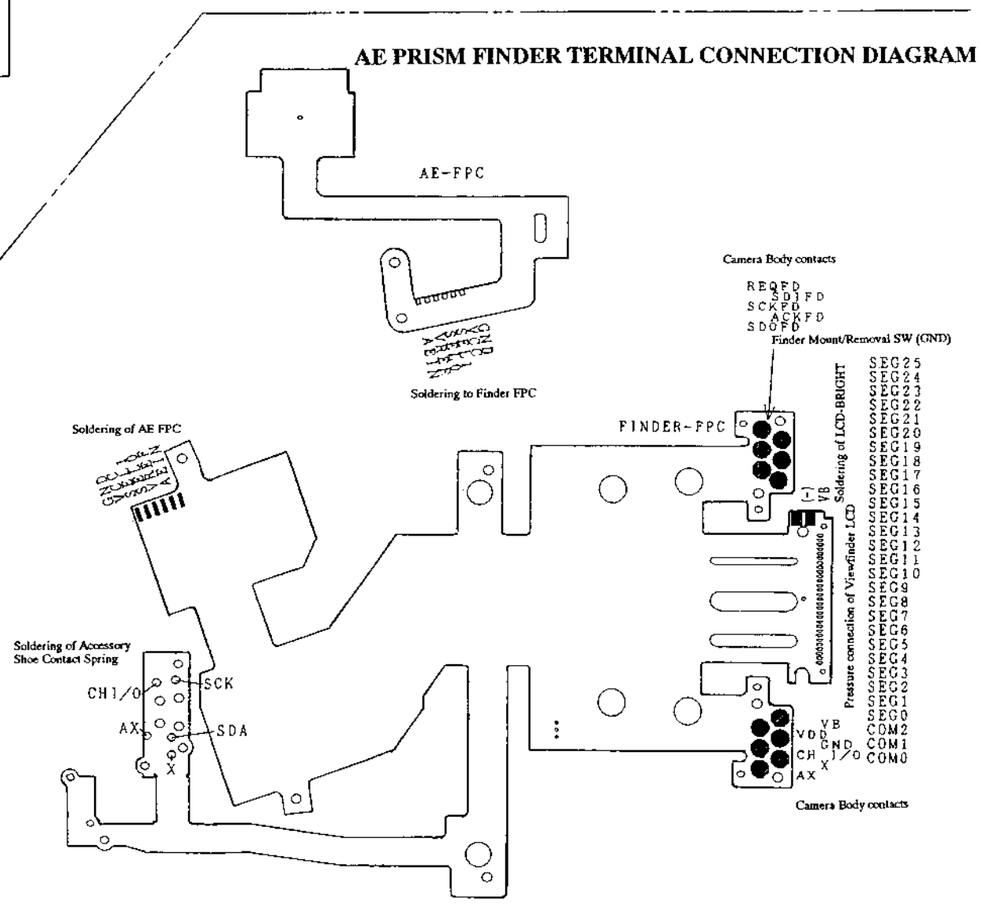


CAMERA BODY TERMINAL CONNECTION DIAGRAM

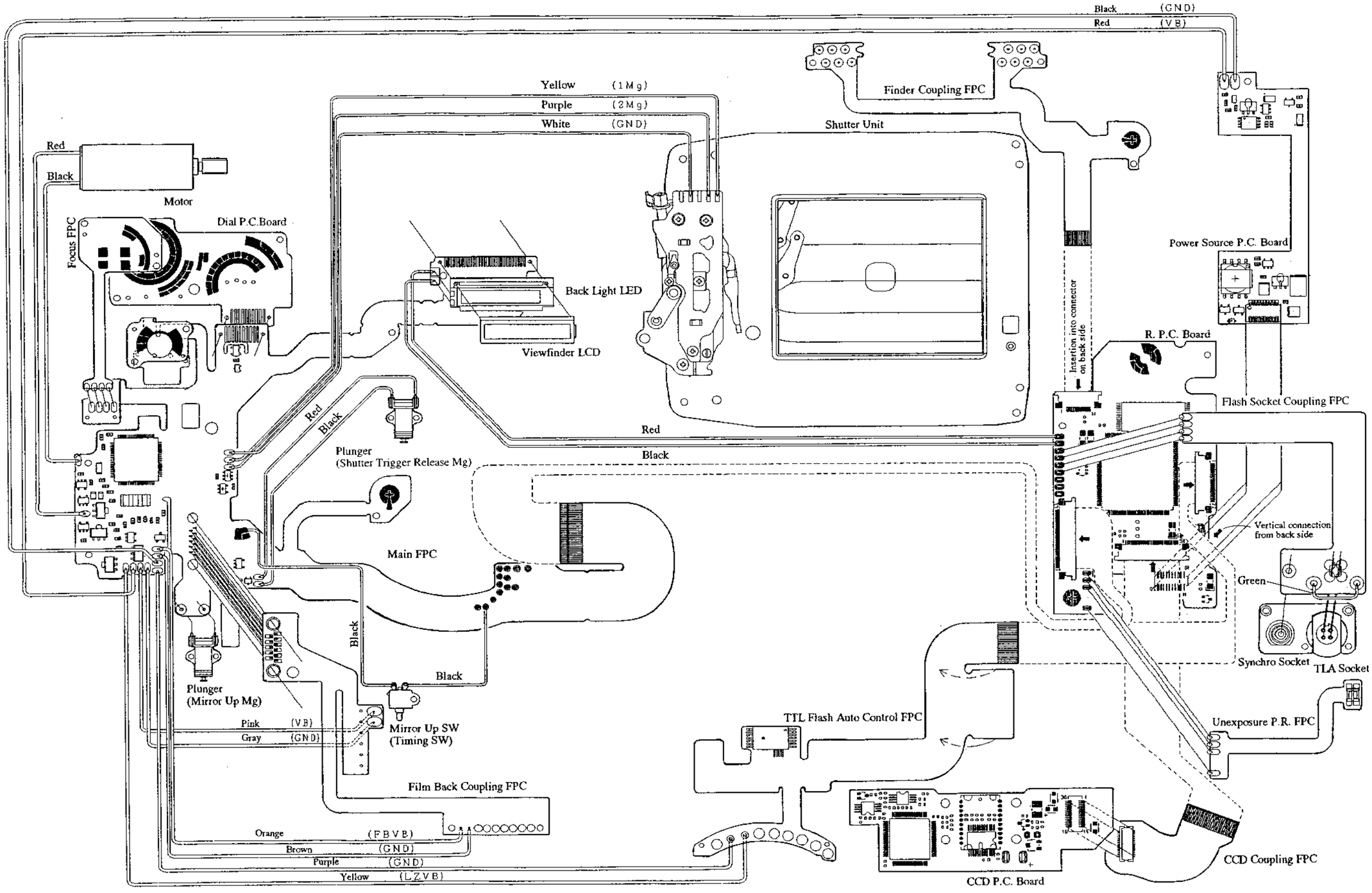
FILM BACK TERMINAL CONNECTION DIAGRAM



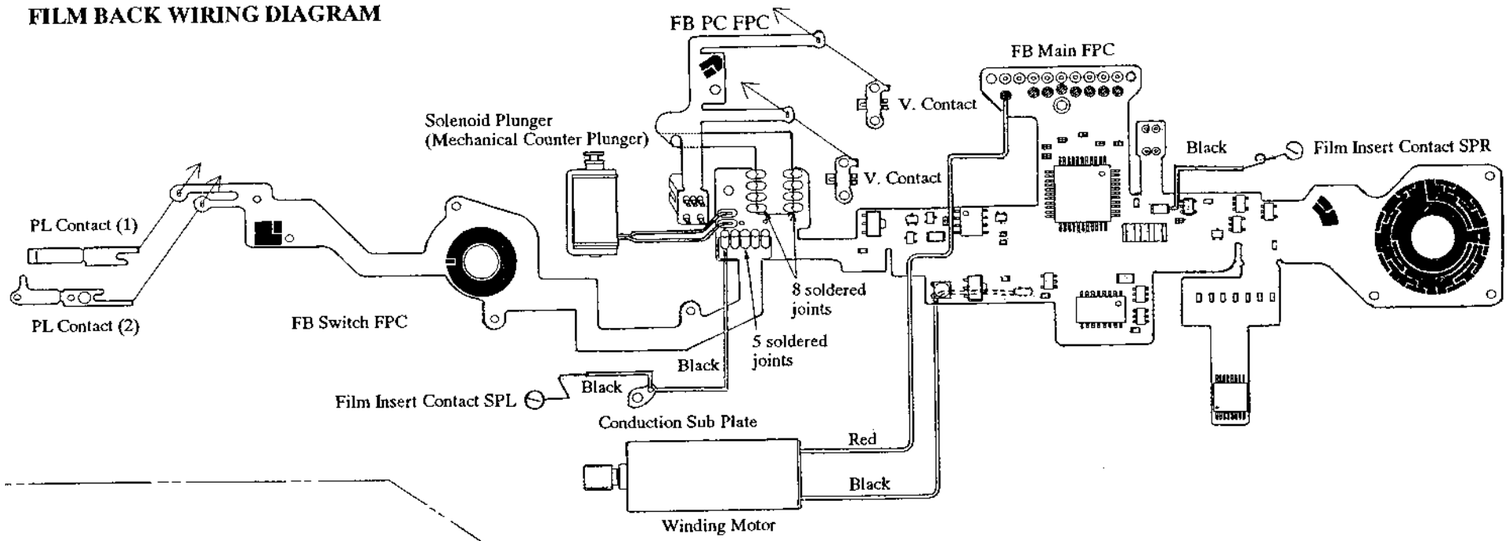
AE PRISM FINDER TERMINAL CONNECTION DIAGRAM



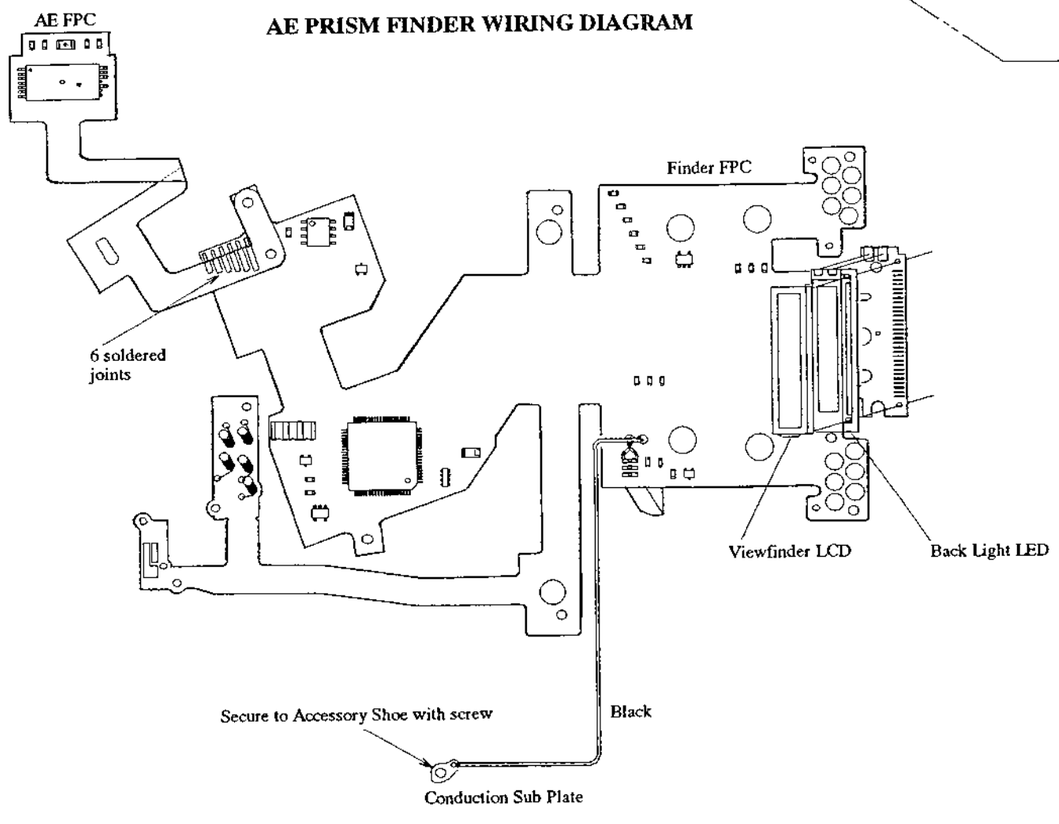
CAMERA BODY WIRING DIAGRAM



FILM BACK WIRING DIAGRAM



AE PRISM FINDER WIRING DIAGRAM



KYOCERA

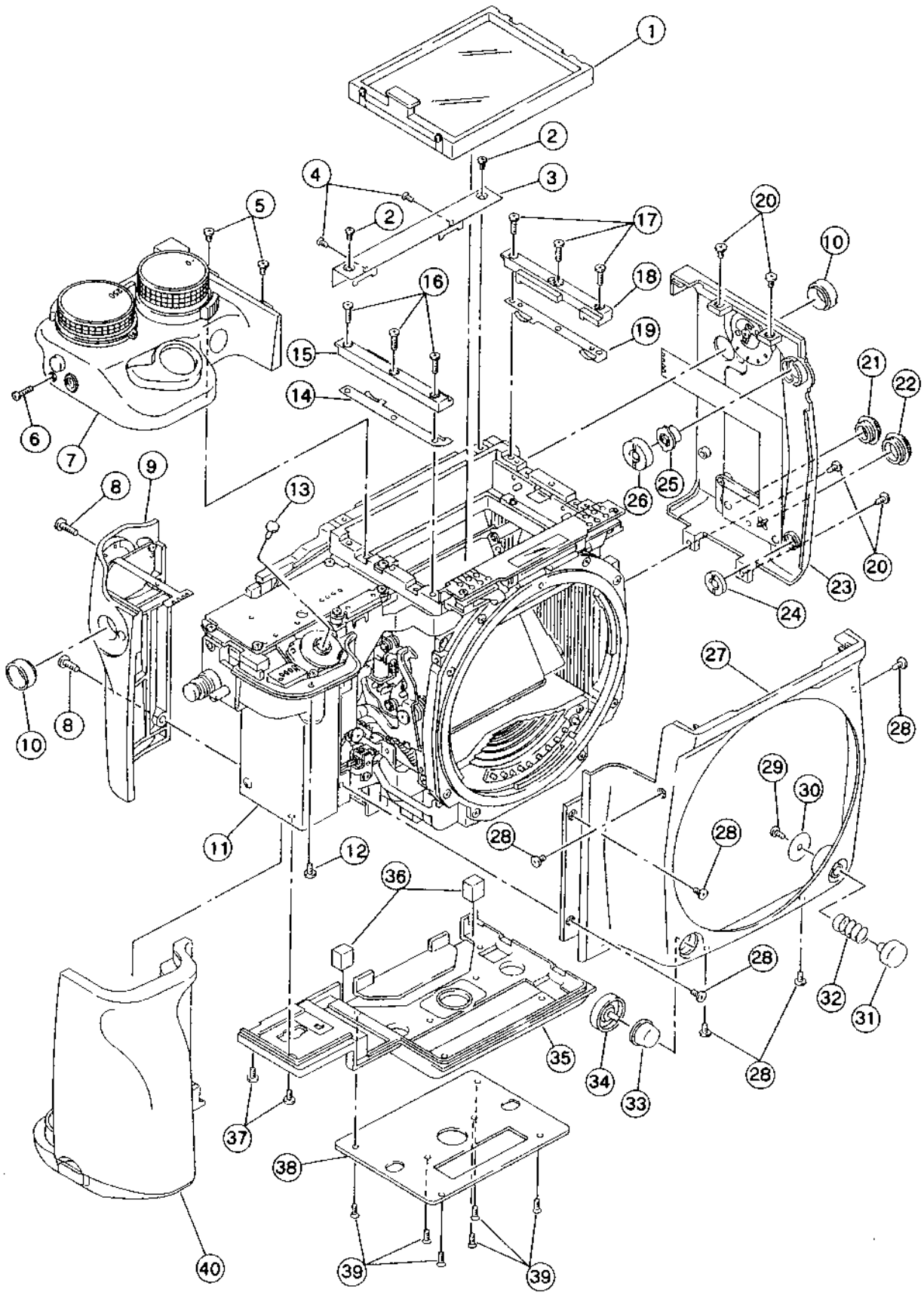
CONTAX 645

ASSEMBLING CHART

KYOCERA CORPORATION
Optical Equipment Group
Service Dept. 1AU 990428

No.1

REF No.1AU



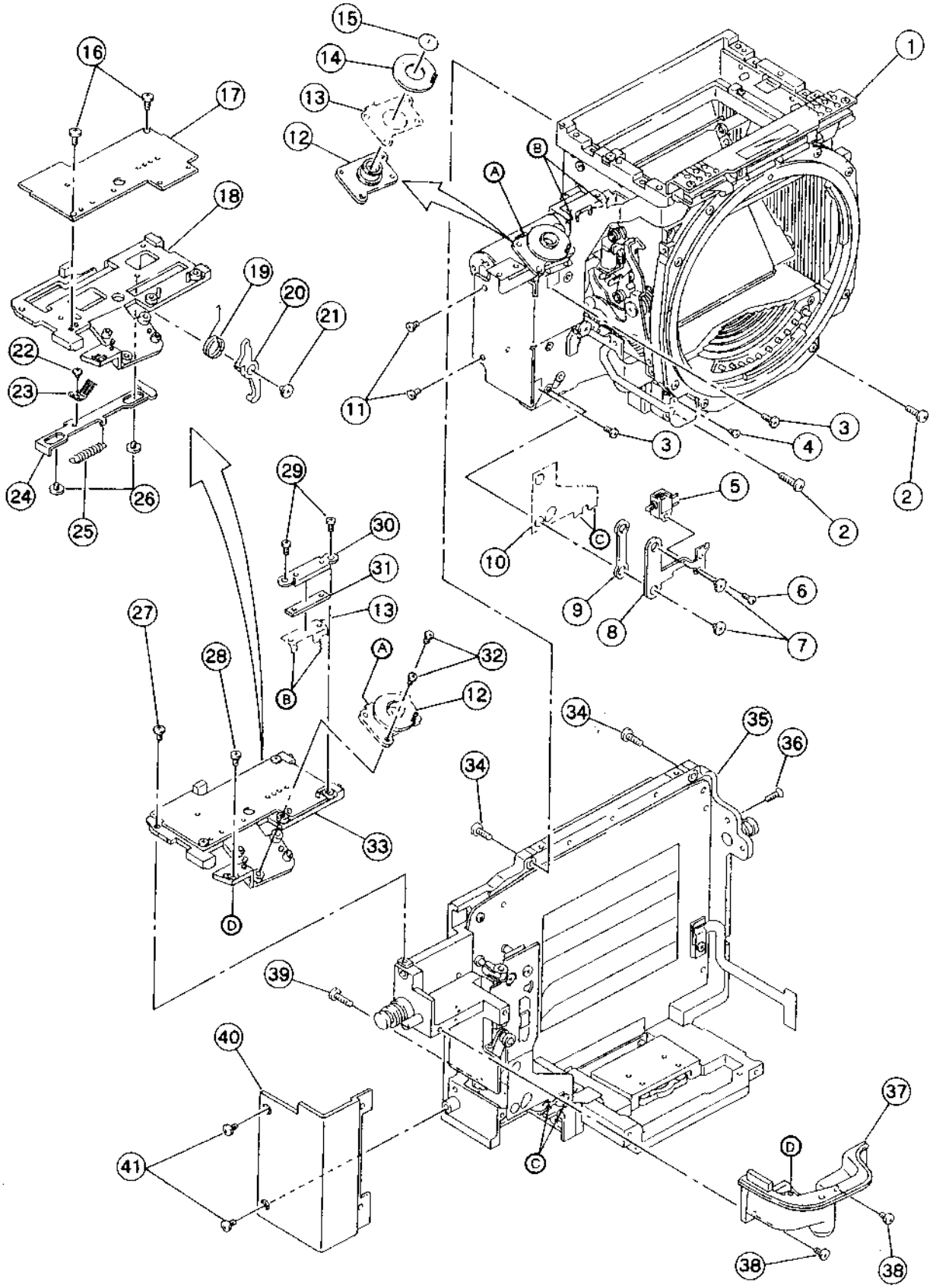
	PARTS No.	DESCRIPTION		QTY
1	1AUB8000	FS CASE ASS'Y		1
2	61913029	FB HOOK COVER S.S		2
3	1AU11000	FB HOOK COVER		1
4	66001294	FB HOOK COVER S.S		2
5	66001068	TOP COVER ASS'Y S.S		2
6	66001302	TOP COVER ASS'Y S.S		1
7	1AUB7000	TOP COVER ASS'Y	(See Page No.6)	1
8	63925026	REAR COVER ASS'Y S.S		2
9	1AUB6000	REAR COVER ASS'Y	(See Page No.7)	1
10	1AU14100	STRAP LUG RETAINER		2
11	*	CAMERA BODY		1
12	66001099	TOP COVER ASS'Y S.S		1
13	1AU24200	RELEASE SHAFT		1
14	1AU77900	F. RAIL FRICTION SPRING (2)		1
15	1AU77700	F. RAIL (2)		1
16	61925522	F. RAIL (2) S.S		3
17	61925522	F. RAIL (1) S.S		3
18	1AU77600	F. RAIL (1)		1
19	1AU77800	F. RAIL FRICTION SPRING (1)		1
20	66001068	SIDE COVER ASS'Y S.S		4
21	13913800	SYNCHRO CAP		1
22	26641900	TLA SOCKET CAP		1
23	1AUB6400	SIDE COVER ASS'Y	(See Page No.7)	1
24	1AU25500	REWIND SWITCH		1
25	1AU25300	MIRROR UP BUTTON		1
26	1AU25400	MIRROR UP SWITCH		1
27	*	FRONT COVER		1
28	66001301	FRONT COVER ASS'Y S.S		6
29	63913526	LENS RELEASE BUTTON S.S		1
30	1AU24800	LENS RELEASE WASHER		1
31	1AU24600	LENS RELEASE BUTTON		1
32	1AU24700	LENS RELEASE BUTTON SPRING		1
33	1AU25100	PRE-VIEW BUTTON		1
34	1AU25200	PRE-VIEW SWITCH		1
35	1AU27500	BOTTOM COVER		1
36	1AU16000	B. LIGHT-SHIELD TAPE (1)		2
37	66001301	BOTTOM COVER S.S		2
38	1AU28500	BOTTOM COVER PLATE		1
39	61815022	BOTTOM COVER PLATE S.S		6
40	1AUB8100	GRIP ASS'Y	(See Page No.7)	1

27, 29~32	1AUB6600	FRONT COVER ASS'Y	1

The parts names with * mark are not supplied as a repair parts.

No.2

REF No.1AU

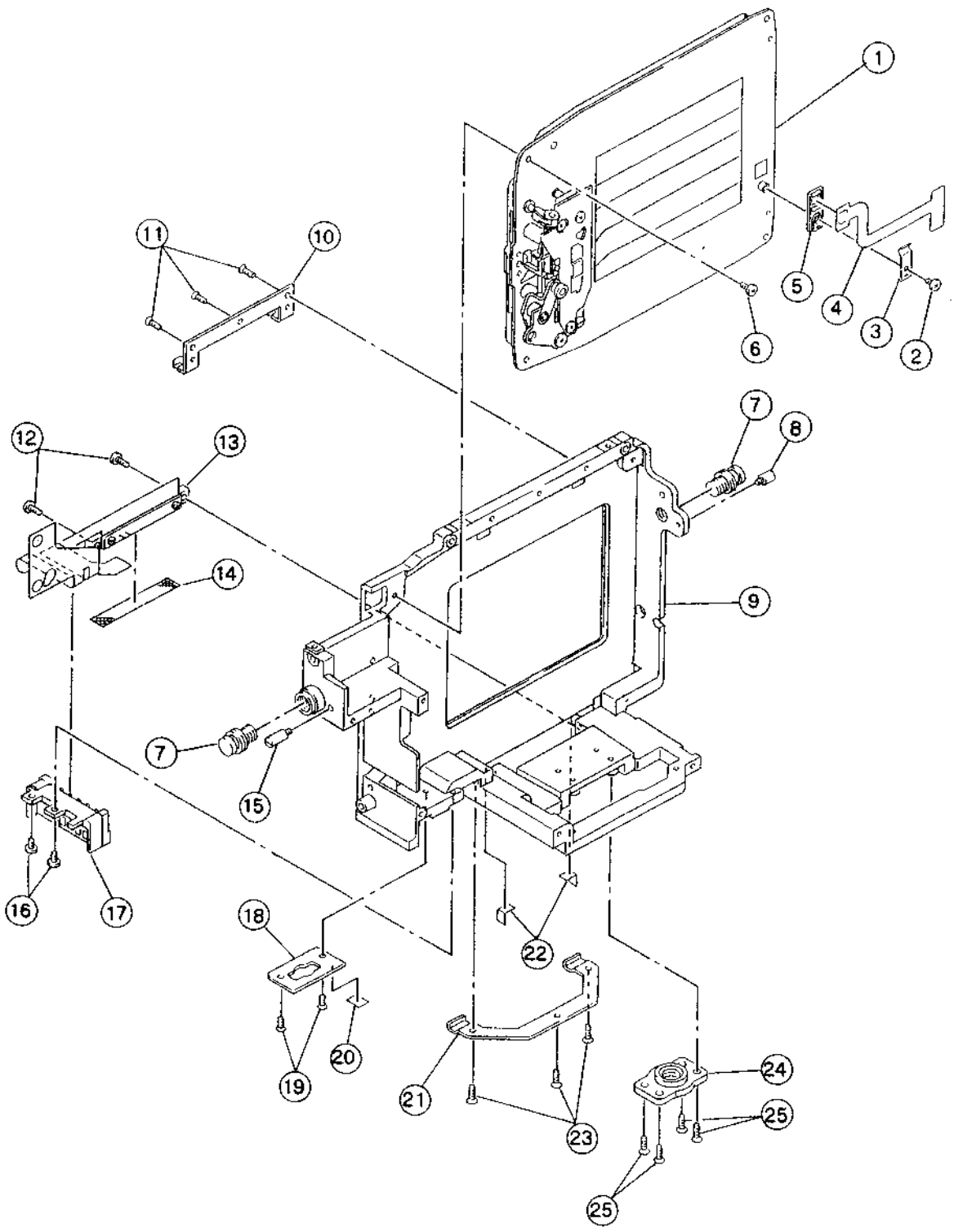


	PARTS No.	DESCRIPTION	QTY
1	*	MOUNT BASE (See Page No.5)	1
2	63928026	MOUNT BASE ASS'Y S.S	2
3	61923526	MOUNT BASE ASS'Y S.S	2
4	61912026	MAIN FPC ASS'Y S.S	1
5	1AF52100	MIRROR UP SWITCH	1
6	61913026	MIRROR UP SWITCH S.S	1
7	66001031	CONNECTOR RETAINING PLATE S.S	2
8	1AU79600	CONNECTOR RETAINING PLATE	1
9	1AU79700	CONNECTOR RUBBER	1
10	*	FILM BACK COUPLING FPC	1
11	63913026	MAIN FPC ASS'Y S.S	2
12	1AUB5000	MAIN SWITCH BASE PLATE ASS'Y	1
13	*	MAIN FPC	1
14	1AUB5100	MAIN CONTACT BASE ASS'Y	1
15	1AU24400	MAIN CONTACT SNAP RING	1
16	69213576	DIAL P.C BOARD ASS'Y S.S	2
17	1AUE2400	DIAL P.C BOARD ASS'Y	1
18	1AU20500	DIAL BASE PLATE	1
19	1AU26900	SECOND CURTAIN LEVER SPRING	1
20	1AU26700	SECOND CURTAIN LEVER	1
21	66001185	SECOND CURTAIN LEVER S.S	1
22	61901426	MECHANICAL BULB CONTACT S.S	1
23	1AU27200	MECHANICAL BULB CONTACT	1
24	1AU26600	MECHANICAL BULB LEVER	1
25	1AU26800	MECHANICAL BULB LEVER SPRING	1
26	66001185	MECHANICAL BULB LEVER S.S	2
27	63913526	DIAL BASE PLATE ASS'Y S.S	1
28	66001099	DIAL BASE PLATE ASS'Y S.S	1
29	66001099	CONNECT PLATE S.S	2
30	1AU27000	CONNECT PLATE	1
31	1AU27100	CONNECT RUBBER	1
32	69113066	MAIN SWITCH BASE PLATE ASS'Y S.S	2
33	1AUB6200	DIAL BASE PLATE ASS'Y	1
34	63926026	MOUNT BASE ASS'Y S.S	2
35	*	CAMERA BODY	1
36	61825026	MOUNT BASE ASS'Y S.S	1
37	1AU27800	BODY COVER (UPPER)	1
38	66001232	BODY COVER (UPPER) S.S	2
39	66001001	MOUNT BASE ASS'Y S.S	1
40	1AU27900	BODY COVER (LOWER)	1
41	66001232	BODY COVER (LOWER) S.S	2

The parts names with * mark are not supplied as a repair parts.

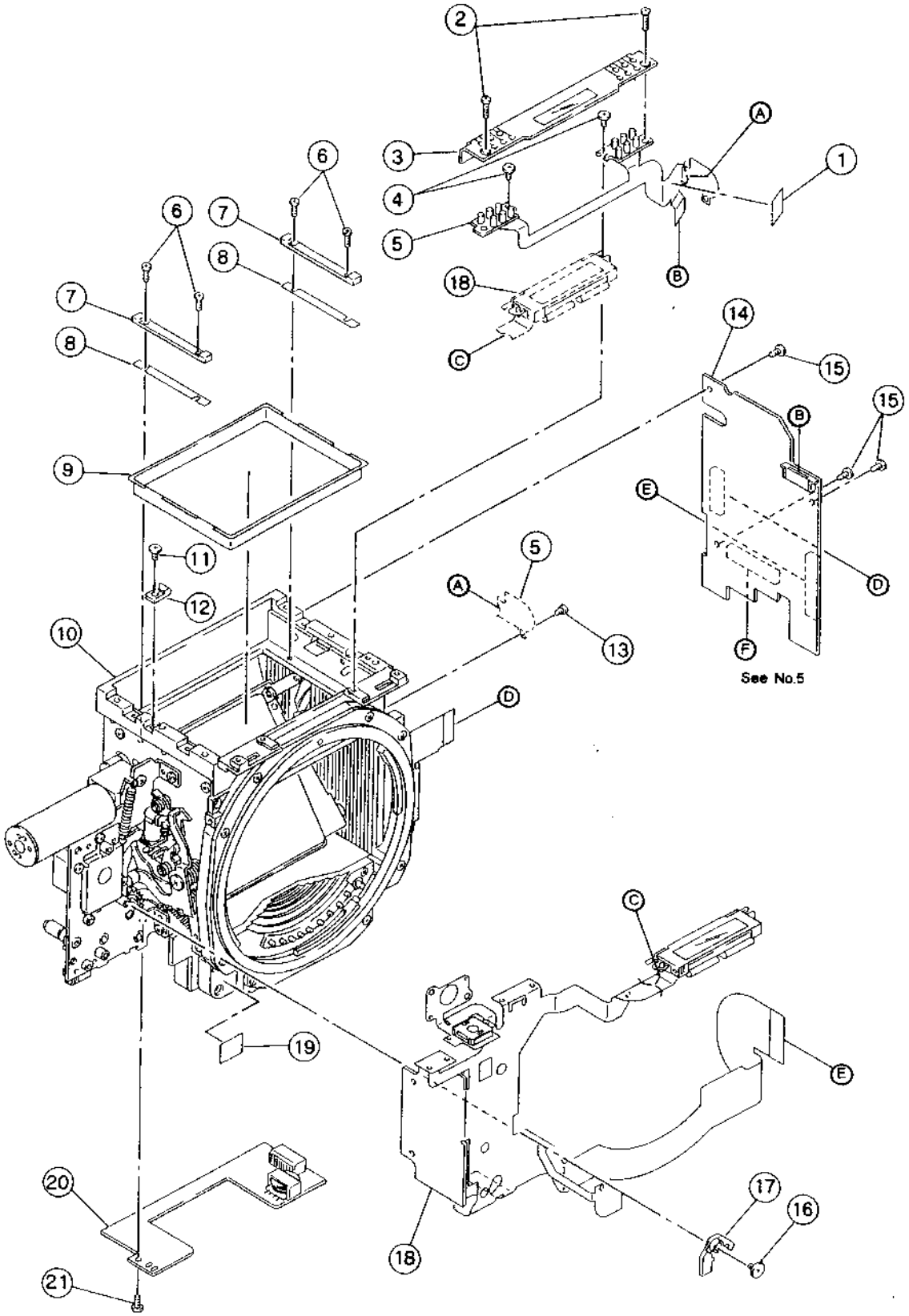
No.3

REF No.1AU



	PARTS No.	DESCRIPTION	QTY
1	1AU10200	SHUTTER UNIT	1
2	66001050	SHUTTER P.R RETAINER S.S	1
3	1AU10400	SHUTTER P.R RETAINER	1
4	1AUE2600	UNEXPOSURE P.R FPC ASS'Y	1
5	1AU10300	SHUTTER P.R HOLDER	1
6	61923526	SHUTTER UNIT S.S	1
7	1AU14000	STRAP LUG	2
8	1AU14500	STRAP STOPPER (R)	1
9	*	CAMERA BODY	1
10	1AU10800	FB HOOK (1)	1
11	61804026	FB HOOK (1) S.S	3
12	66001232	FB CONTACT CASE ASS'Y S.S	2
13	*	FB CONTACT CASE	1
14	1AU16200	B. LIGHT-SHIELD TAPE (3)	1
15	1AU14400	STRAP STOPPER (L)	1
16	69216076	CONNECTOR HOLDER S.S	2
17	*	CONNECTOR HOLDER	1
18	1AF27800	BOTTOM COVER LOCK PLATE	1
19	61814026	BOTTOM COVER LOCK PLATE S.S	2
20	*	DOUBLE-STICK TAPE	1
21	1AU10900	FB HOOK (2)	1
22	1AU16100	B. LIGHT-SHIELD TAPE (2)	2
23	61825026	FB HOOK (2) S.S	3
24	1AU10700	TRIPOD SOCKET	1
25	61925526	TRIPOD SOCKET S.S	4
13, 17	1AUB5500	FB CONTACT CASE ASS'Y	1

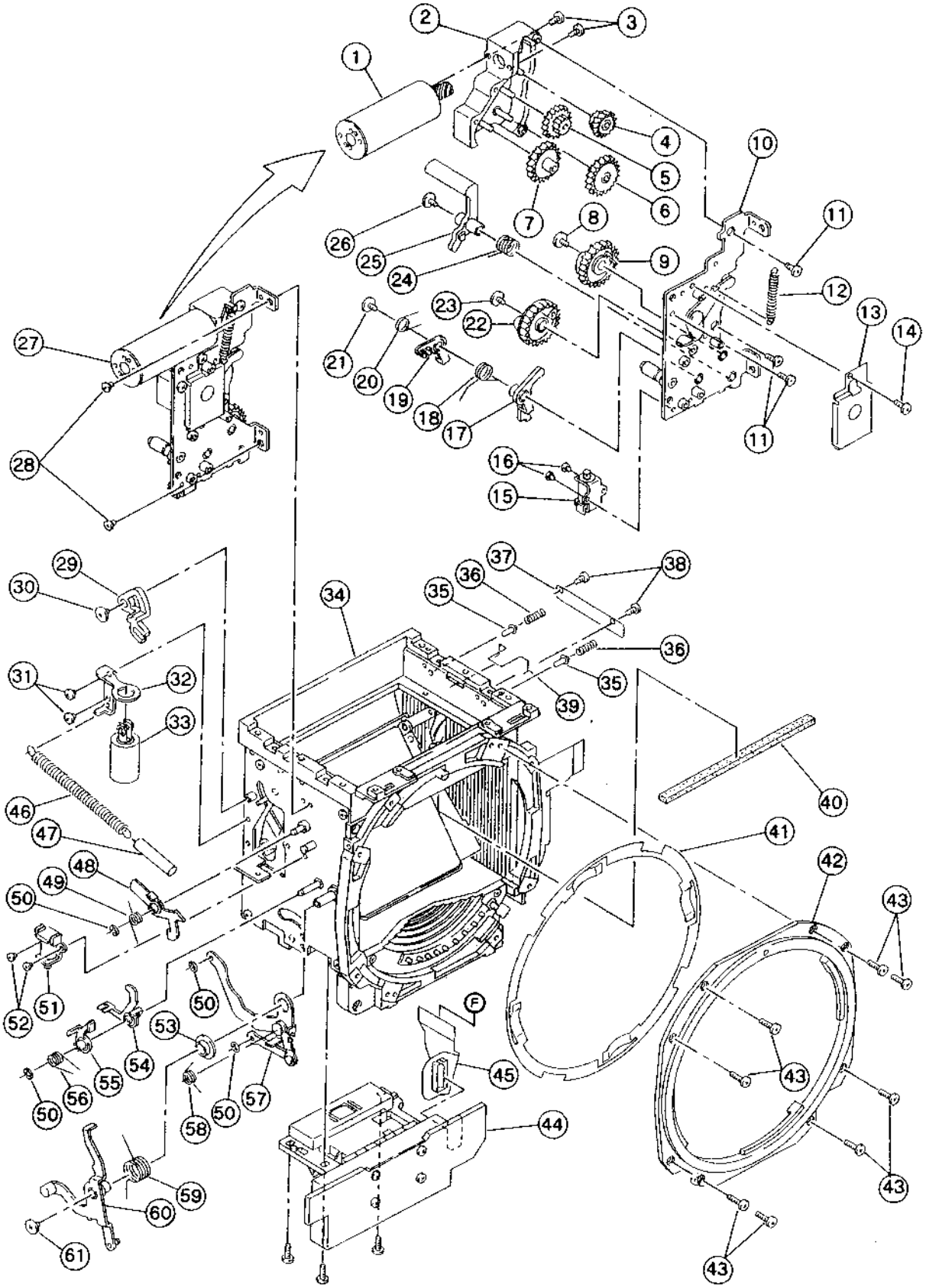
The parts names with * mark are not supplied as a repair parts.


See No.5

	PARTS No.	DESCRIPTION	QTY
1	*	DOUBLE-STICK TAPE	1
2	66001303	F. LCD COVER ASS'Y S.S	2
3	1AUB6700	F. LCD COVER ASS'Y	1
4	66001122	FINDER COUPLING FPC ASS'Y S.S	2
5	1AUE2200	FINDER COUPLING FPC ASS'Y	1
6	61903526	FS HOLDER PLATE S.S	4
7	1AU78100	FS HOLDER PLATE	2
8	1AU76900	FOCUS ADJUSTING PLATE (t:0.2)	2
	1AU77400	FOCUS ADJUSTING PLATE (t:0.1)	2
	1AU77500	FOCUS ADJUSTING PLATE (t:0.05)	2
9	1AU76800	REVERSE INCIDENT-LIGHT FRAME	1
10	*	MOUNT BASE	1
11	66001068	FS CLICK S.S	1
12	1AU78000	FS CLICK	1
13	61912026	FINDER COUPLING FPC ASS'Y S.S	1
14	1AUE1600	R. P.C BOARD ASS'Y	1
15	63913526	R. P.C BOARD ASS'Y S.S	3
16	66001225	TIMING SWITCH LEVER S.S	1
17	1AU76300	TIMING SWITCH LEVER	1
18	1AUE2000	MAIN FPC ASS'Y	1
19	*	DOUBLE-STICK TAPE	1
20	1AUE1400	POWER SOURCE P.C BOARD	1
21	63914526	POWER SOURCE P.C BOARD S.S	1

The parts names with * mark are not supplied as a repair parts.

REF No.1AU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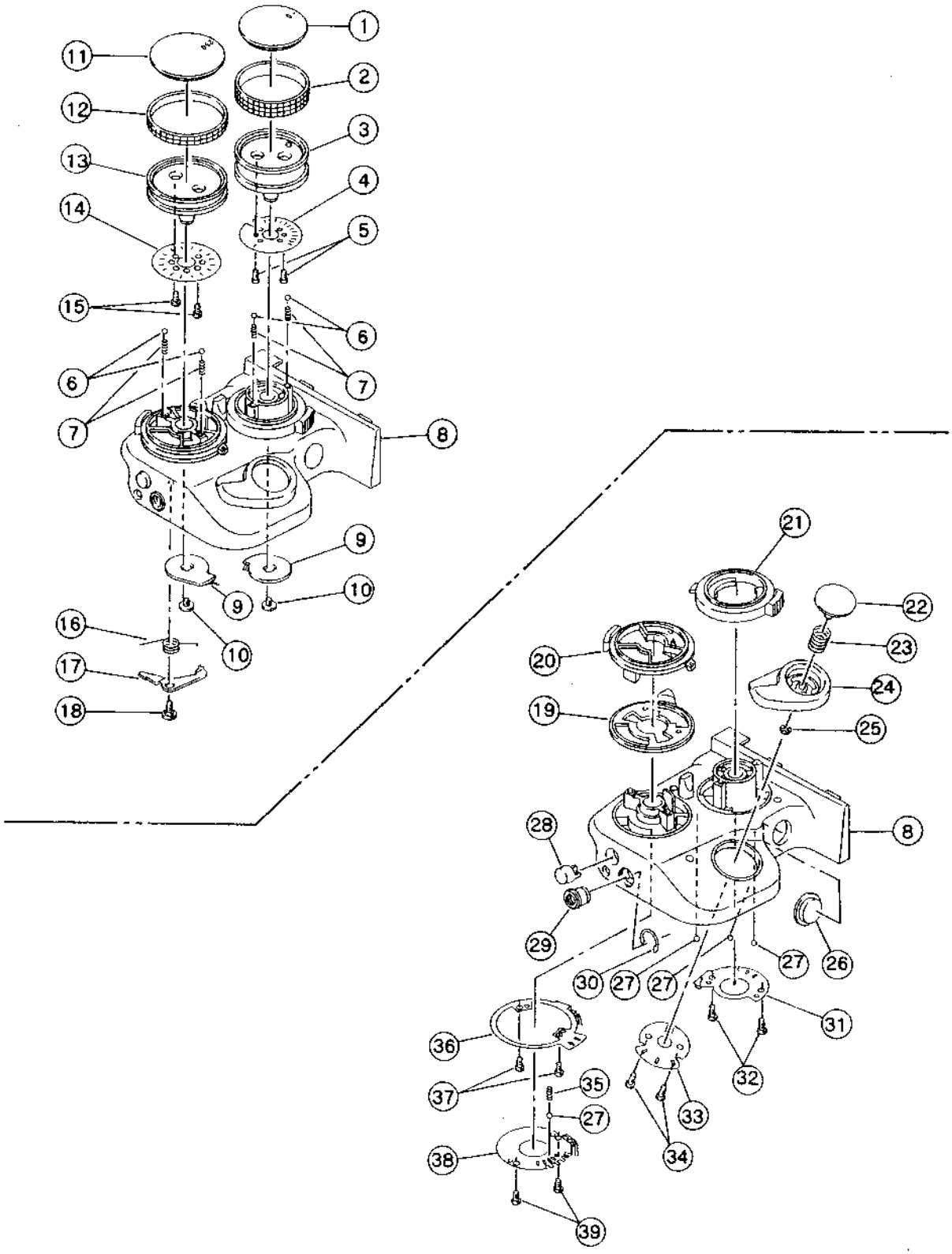
	PARTS No.	DESCRIPTION	QTY
1	1AU52300	MOTOR	1
2	1AU73600	CHARGE GEAR BOX	1
3	63913526	MOTOR S.S	2
4	1AU73700	CHARGE GEAR (1)	1
5	1AU73800	CHARGE GEAR (2)	1
6	1AU73900	CHARGE GEAR (3)	1
7	1AU74000	CHARGE GEAR (4)	1
8	66001225	CHARGE CAM (2) S.S	1
9	1AU74300	CHARGE CAM (2)	1
10	*	CHARGE BASE PLATE	1
11	69214066	CHARGE BASE PLATE S.S	3
12	1AU75100	M. CHARGE SPRING	1
13	1AU74500	FPC COVER PLATE	1
14	69214066	FPC COVER PLATE S.S	1
15	1AU52400	PLUNGER	1
16	61901626	PLUNGER S.S	2
17	1AU76000	RELEASE CHARGE LEVER	1
18	1AU76100	RELEASE CHARGE SPRING	1
19	1AUB3900	RELEASE MG LEVER ASS'Y	1
20	1AU75900	RELEASE MG SPRING	1
21	66001225	RELEASE MG LEVER ASS'Y S.S	1
22	1AU74100	CHARGE CAM (1)	1
23	66001225	CHARGE CAM (1) S.S	1
24	1AU75500	RELEASE LEVER SPRING	1
25	1AU75300	RELEASE LEVER	1
26	66001225	RELEASE LEVER S.S	1
27	1AUB3400	CHARGE BASE PLATE ASS'Y	1
28	63922026	CHARGE BASE PLATE ASS'Y S.S	2
29	1AU64200	AD LEVER	1
30	66001225	AD LEVER S.S	1
31	63911626	AD BASE PLATE S.S	2
32	1AU65000	AD BASE PLATE	1
33	1AUB2100	AD CONNECTING ROD ASS'Y	1
34	*	MOUNT BASE	1
35	1AU77300	FS PIN	2
36	1AU71600	LENS LOCK PIN SPRING	2
37	1AU77200	FS RETAINING BASE PLATE	1
38	61913026	FS RETAINING BASE PLATE S.S	2
39	1AU77100	FS RETAINING SPRING	1
40	1AU71800	MIRROR MOQUETTE	1
41	1AU70300	MOUNT PLATE SPRING	1
42	1AU70200	BODY MOUNT	1
43	61925526	BODY MOUNT S.S	8
44	*	AF MODULE	1
45	1AUE1900	CCD COUPLING FPC ASS'Y	1
46	1AU61800	MIRROR UP SPRING	1
47	1AW76900	APERTURE LEVER SPRING COVER	1
48	1AUB1600	MIRROR START LEVER ASS'Y	1
49	1AU62400	MIRROR START SPRING	1
50	66101225	E RING (E-12)	4
51	1AU52400	PLUNGER	1
52	61901626	PLUNGER S.S	2
53	1AU60400	MIRROR UP COLLAR	1
54	1AUB1700	MIRROR MG LEVER ASS'Y	1
55	1AUB1800	MG CHARGE LEVER ASS'Y	1
56	1AU63300	MG CHARGE SPRING	1
57	1AUB1900	MIRROR UP LEVER ASS'Y	1
58	1AU60800	P. PLATE SPRING	1
59	1AU60500	MIRROR DOWN SPRING	1
60	1AUB2000	MIRROR DRIVING LEVER ASS'Y	1
61	66001225	MIRROR DRIVING LEVER ASS'Y S.S	1
29-61	1AUA10SP	S-MOUNT BASE ASS'Y	1

The parts names with * mark are not supplied as a repair parts.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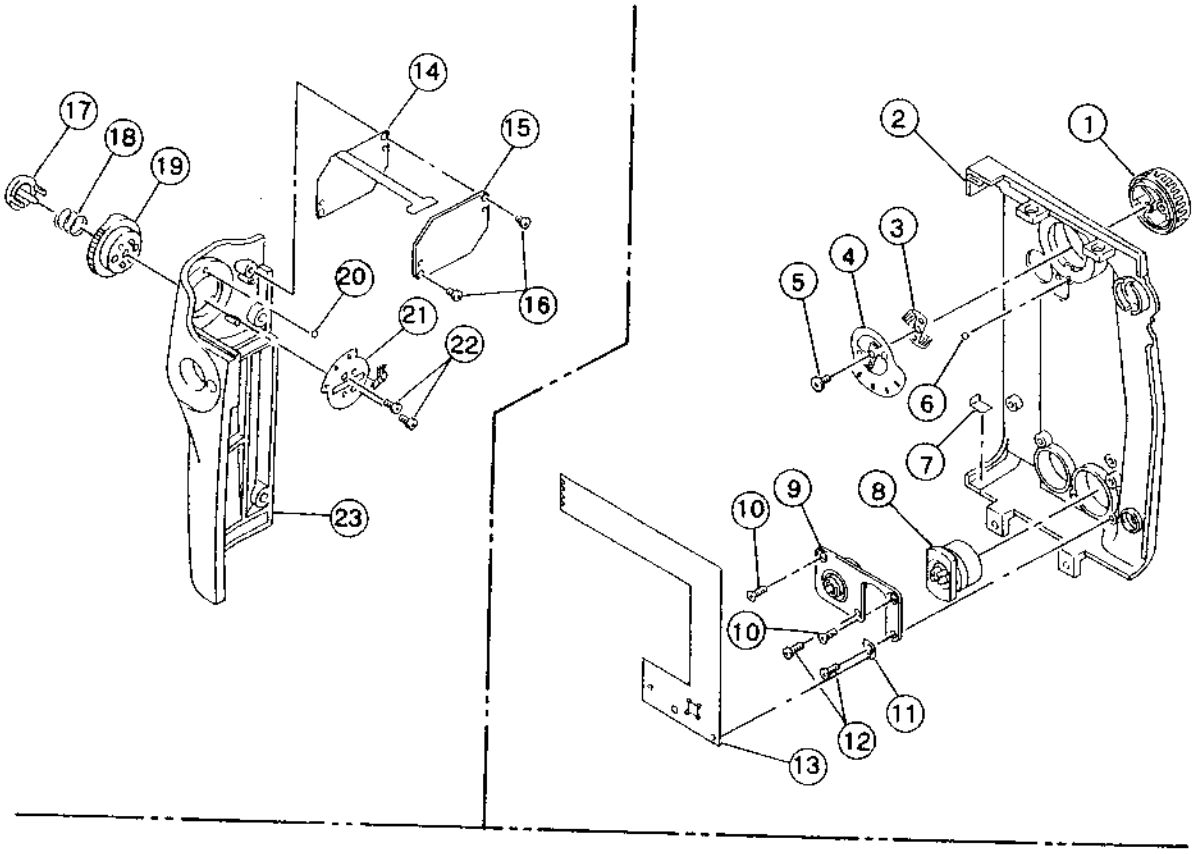
	PARTS No.	DESCRIPTION	QTY
1	1AU20600	EXP. COMPENSATION DIAL NAME PLATE	1
2	14126100	ASA DIAL COVER	1
3	1AU20700	EXP. COMPENSATION DIAL	1
4	1AU20800	EXP. COMPENSATION DIAL CLICK	1
5	69103076	EXP. COMPENSATION DIAL CLICK S.S	2
6	66701520	STEEL BALL (ϕ 1.5)	4
7	1AU21000	EXP. COMPENSATION CLICK SPRING	4
8	*	TOP COVER	1
9	1AUB7500	EXP. COMPENSATION CONTACT BASE ASS'Y	2
10	66001218	EXP. COMPENSATION CONTACT BASE ASS'Y S.S	2
11	1AU21700	SHUTTER DIAL NAME PLATE	1
12	1AU21900	SHUTTER DIAL COVER	1
13	1AU21800	SHUTTER DIAL	1
14	1AU22000	SHUTTER DIAL CLICK	1
15	69113076	SHUTTER DIAL CLICK S.S	2
16	1AU22700	MODE LOCK SPRING	1
17	1AU22600	MODE LOCK PLATE	1
18	66001174	MODE LOCK PLATE S.S	1
19	1AU23100	PRE-FLASH LEVER	1
20	1AU22400	MODE LEVER	1
21	1AU21300	ABC LEVER	1
22	1AU23700	SHUTTER RELEASE BUTTON	1
23	1AH22000	RELEASE SPRING	1
24	1AU23600	MAIN SWITCH LEVER	1
25	66101225	E RING (E-12)	1
26	1AU20200	SELF-TIMER WINDOW	1
27	66701520	STEEL BALL (ϕ 1.5)	4
28	1AU22800	MODE LOCK RELEASE BUTTON	1
29	1AU26500	MECHANICAL BULB SOCKET	1
30	66150525	CE RING	1
31	1AUB7300	ABC CLICK ASS'Y	1
32	69113576	ABC CLICK ASS'Y S.S	2
33	1AU23800	MAIN SWITCH CLICK	1
34	69113576	MAIN SWITCH CLICK S.S	2
35	1AU21000	EXP. COMPENSATION CLICK SPRING	1
36	1AUB7600	PF LEVER ASS'Y	1
37	69113576	PF LEVER ASS'Y S.S	2
38	1AUB7700	MODE CLICK ASS'Y	1
39	69113576	MODE CLICK ASS'Y S.S	2
1-39	1AUB7000	TOP COVER ASS'Y	1

The parts names with * mark is not supplied as a repair parts.

REF No.1AU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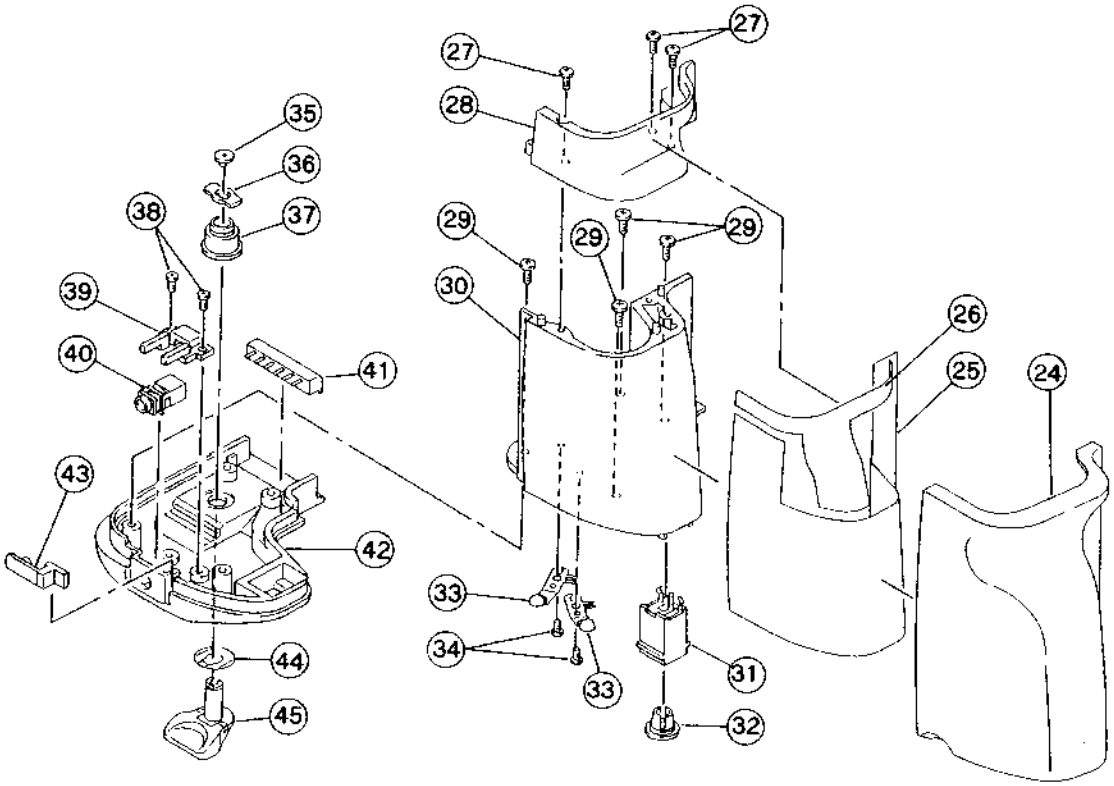
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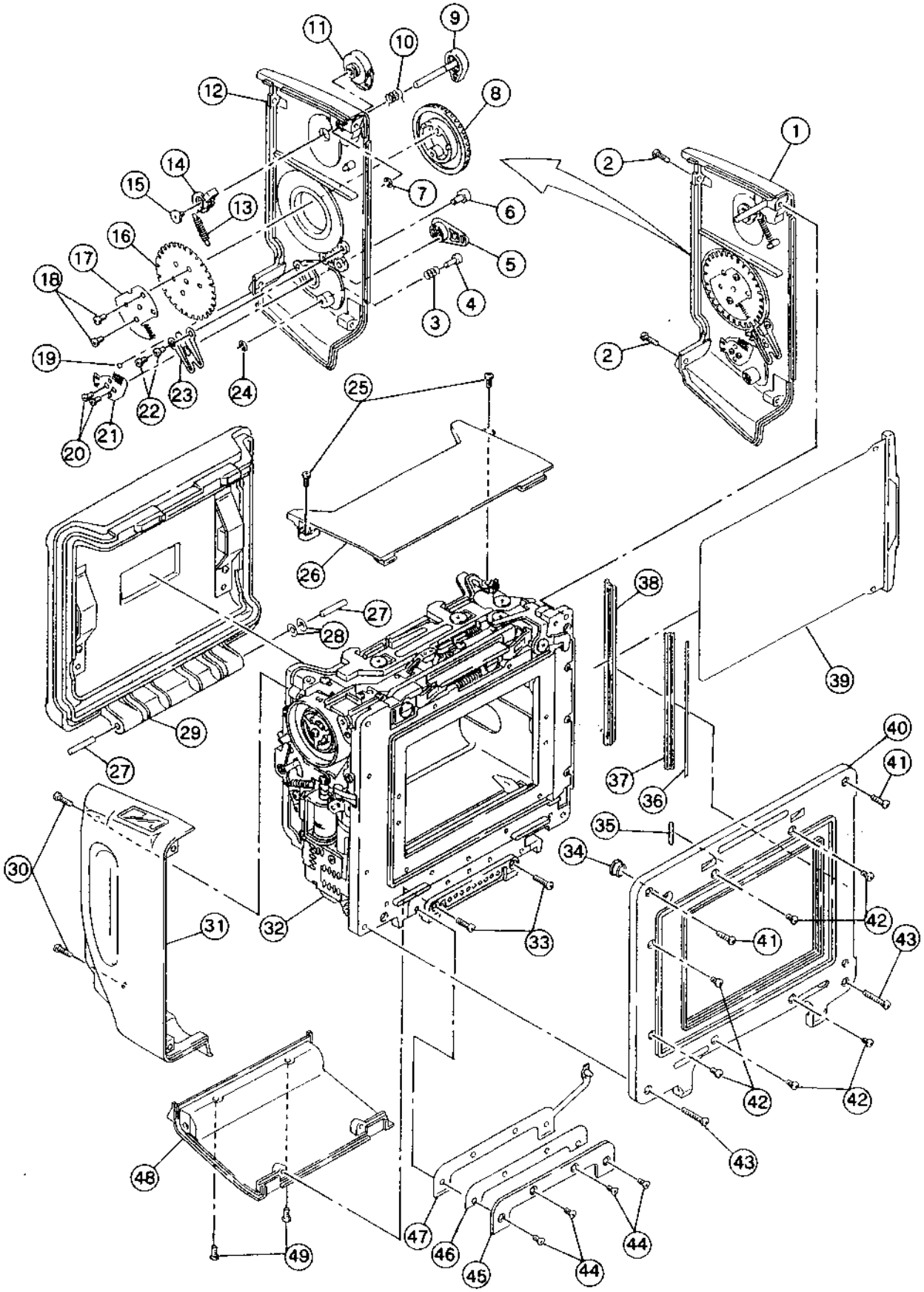
	PARTS No.	DESCRIPTION	QTY
1	1AU25600	DRIVE DIAL	1
2	*	SIDE COVER	1
3	1AU25800	DRIVE CONTACT	1
4	1AU25700	DRIVE CLICK	1
5	66001126	DRIVE CLICK S.S	1
6	66701520	STEEL BALL (φ1.5)	1
7	1AU16300	B. LIGHT-SHIELD TAPE (4)	1
8	1AU26300	TLA SOCKET	1
9	1AUB6500	S. SOCKET ASS'Y	1
10	69314076	S. SOCKET ASS'Y S.S	2
11	3CU16600	CONDUCTION SUB PLATE	1
12	69114076	S. SOCKET ASS'Y S.S	2
13	1AU51900	FLASH SOCKET COUPLING FPC	1
14	1AUE2300	FOCUS FPC ASS'Y	1
15	1AU28300	AFL FPC HOLDER	1
16	69113076	AFL FPC HOLDER S.S	2
17	1AU28100	AF LOCK BUTTON	1
18	1AQ26400	RELEASE SPRING	1
19	1AU28000	AF CHANGE LEVER	1
20	66701520	STEEL BALL (φ1.5)	1
21	1AUB6100	AF CHANGE CLICK PLATE ASS'Y	1
22	69112276	AF CHANGE CLICK PLATE ASS'Y S.S	2
23	*	REAR COVER	1
24	1AU12400	GRIP COVER	1
25	1AU13800	GRIP TAPE (LOWER)	1
26	1AU13700	GRIP TAPE (UPPER)	1
27	69216076	GRIP BASE (UPPER) S.S	3
28	1AU12500	GRIP BASE (UPPER)	1
29	69224566	GRIP BASE (MIDDLE) S.S	4
30	1AU12600	GRIP BASE (MIDDLE)	1
31	1AM18400	EXTERNAL POWER JACK	1
32	1AM18500	EXTERNAL POWER CAP	1
33	1AU13900	BATTERY CONTACT	2
34	69213066	BATTERY CONTACT S.S	2
35	66001049	G. KNOB LOCK S.S	1
36	1AU14600	G. KNOB LOCK	1
37	1AU13600	G. KNOB HOLDER SHAFT	1
38	69113566	CR JACK HOLDER S.S	2
39	1AU13100	CR JACK HOLDER	1
40	1AU52000	CR JACK	1
41	1AU12900	G. CONNECTOR	1
42	1AUB8500	GRIP BASE (LOWER) ASS'Y	1
43	1AU13200	CR JACK CAP	1
44	1AU13500	G. KNOB WASHER	1
45	1AUB8300	G. KNOB BASE ASS'Y	1
1-13	1AUB6400	SIDE COVER ASS'Y	1
14-23	1AUB6000	REAR COVER ASS'Y	1
24-45	1AUB8100	GRIP ASS'Y	1
31, 33, 40, 41	1AUB8200	G. CONNECTOR ASS'Y	1

The parts names with * mark are not supplied as a repair parts.

No.8

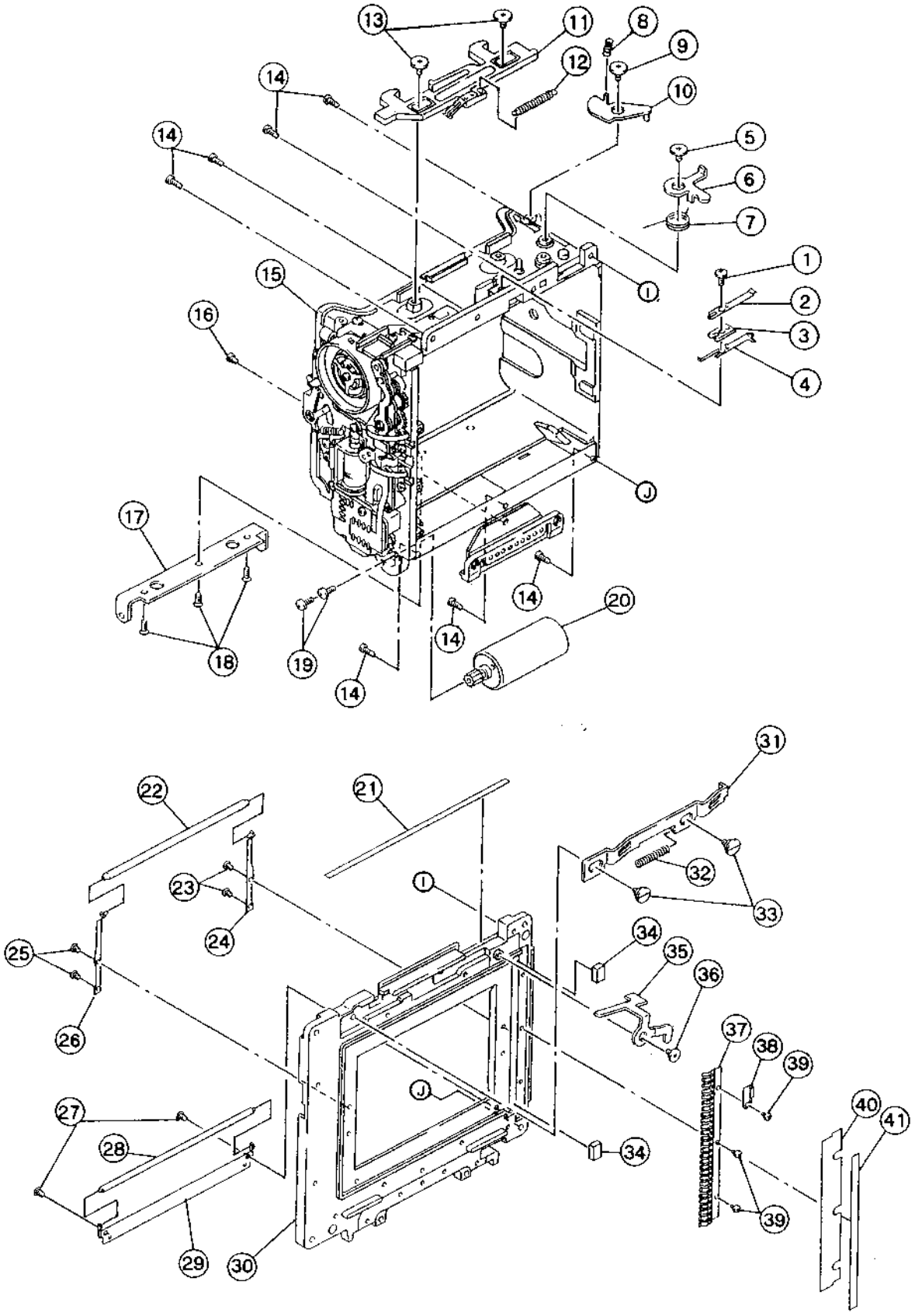
REF No.1AU



8	PARTS No.	DESCRIPTION	QTY
1	1AUD2300	FB SIDE COVER (R) ASS'Y	1
2	69114076	FB SIDE COVER (R) ASS'Y S.S	2
3	1AU42400	MULTIPLE EXPOSURE LOCK SPRING	1
4	1AU42300	MULTIPLE EXPOSURE LOCK BUTTON	1
5	1AU42500	MULTIPLE EXPOSURE LEVER	1
6	1AU43300	ISO LOCK RELEASE BUTTON	1
7	66101225	E RING (E-1.2)	1
8	1AU42800	ISO DIAL	1
9	1AUD2700	BL BUTTON ASS'Y	1
10	1AU41800	BL BUTTON SPRING	1
11	1AUD2400	B. LOCK BASE ASS'Y	1
12	*	FB SIDE COVER (R)	1
13	1AU42100	BACK COVER LEVER SPRING	1
14	1AU42000	BACK COVER LEVER	1
15	66001049	BACK COVER LEVER S.S	1
16	1AU42900	ISO PLATE	1
17	1AU43000	ISO BRUSH CONTACT	1
18	69112566	ISO BRUSH CONTACT S.S	2
19	66701520	STALL BALL (ϕ1.5)	1
20	69102566	MULTIPLE EXPOSURE CONTACT S.S	2
21	1AU42600	MULTIPLE EXPOSURE CONTACT	1
22	69112566	ISO LOCK PLATE S.S	2
23	1AU43400	ISO LOCK PLATE	1
24	66101225	E RING (E-1.2)	1
25	69114076	FB TOP COVER S.S	2
26	1AU41100	FB TOP COVER	1
27	66671630	PARALLEL PIN	2
28	60122140	WASHER	2
29	1AUD2100	BACK COVER ASS'Y	1
30	69114076	FB SIDE COVER (L) ASS'Y S.S	2
31	1AUD2200	FB SIDE COVER (L) ASS'Y	1
32	*	FILM BACK	1
33	69117079	FB BOTTOM COVER S.S	2
34	1AU44700	FB GUIDE HOLDER	1
35	1AU44400	FB HOOK PIN	1
36	1AU43900	FB TAPE (5)	1
37	1AU29600	FB LIGHT-SHIELD CURTAIN	1
38	1AU40800	DARK SLIDE GUIDE	1
39	1AU40100	DARK SLIDE	1
40	1AU40900	FB FRONT COVER	1
41	69116079	FB FRONT COVER S.S	2
42	61912529	FB FRONT COVER S.S	6
43	69119079	FB FRONT COVER S.S	2
44	61813522	BC PLATE (1) S.S	4
45	1AU32600	BC PLATE (1)	1
46	1AU32700	BC PLATE (2)	1
47	1AUD0700	BC PLATE (3) ASS'Y	1
48	1AU41000	FB BOTTOM COVER	1
49	69114076	FB BOTTOM COVER S.S	2

The parts names with * mark are not supplied as a repair parts.

REF No.1AU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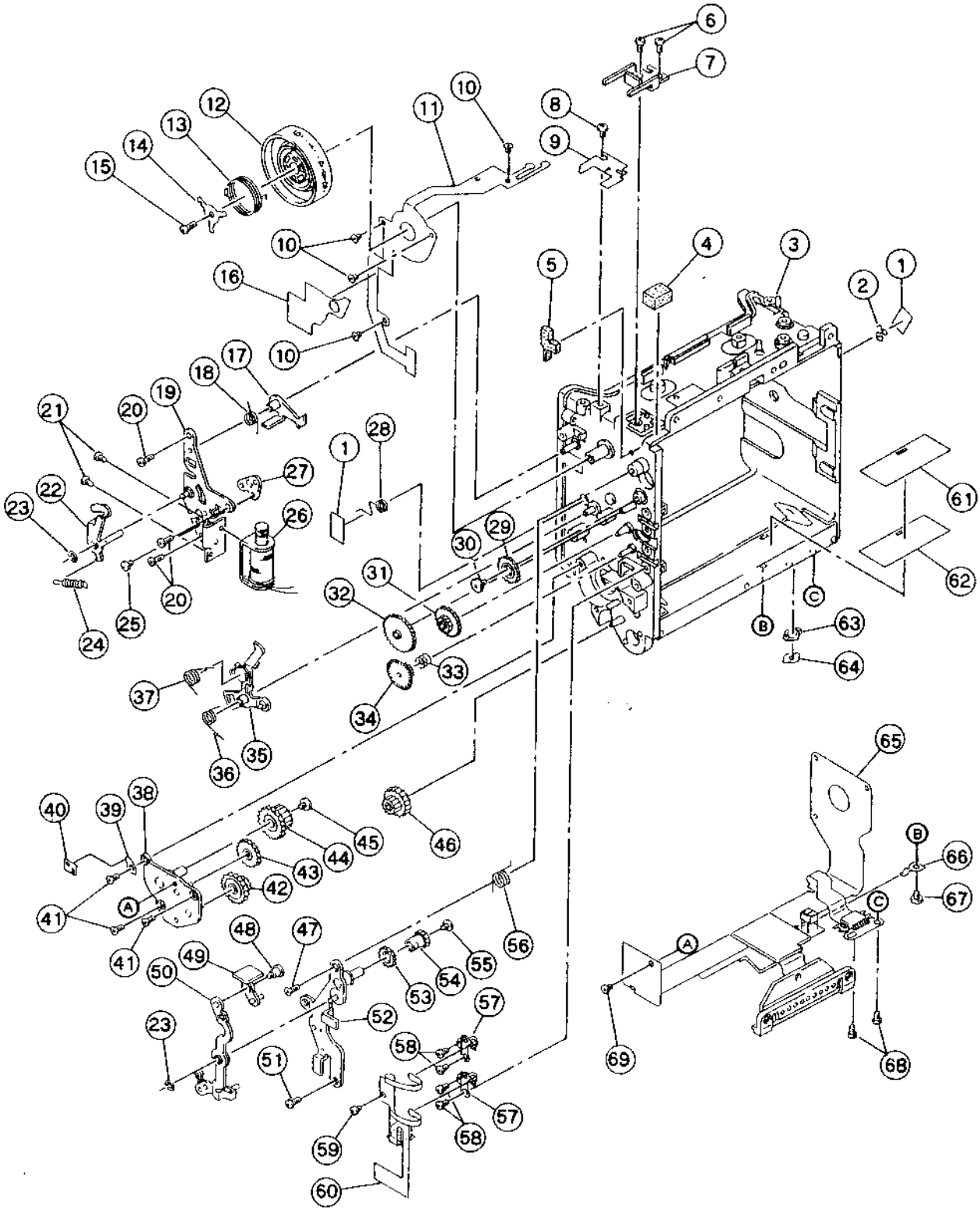
	PARTS No.	DESCRIPTION	QTY
1	69214076	PL CONTACT (1) S.S	1
2	1AU31800	PL CONTACT (1)	1
3	1AU32000	PL CONTACT SPACER	1
4	1AU31900	PL CONTACT (2)	1
5	66001162	BL PLATE (3) S.S	1
6	1AU30600	BL PLATE (3)	1
7	1AU30800	BL PLATE (3) SPRING	1
8	1AU31600	BACK COVER CAM SPRING	1
9	66001162	BACK COVER CAM ASS'Y S.S	1
10	1AUD1900	BACK COVER CAM ASS'Y	1
11	1AUD1800	BACK COVER LOCK ASS'Y	1
12	1AU31300	BACK COVER LOCK SPRING	1
13	66001162	BACK COVER LOCK ASS'Y S.S	2
14	61913526	RAIL PLATE S.S	7
15	*	FILM BACK	1
16	61912022	FB MAIN FPC ASS'Y S.S	1
17	1AU33800	UH PLATE	1
18	69313576	UH PLATE S.S	3
19	63914526	WINDING MOTOR S.S	2
20	1AU52300	WINDING MOTOR	1
21	1AU30300	LP LIGHT-SHIELD TAPE (1)	1
22	1AU34700	AP ROLLER	1
23	66001292	AP ROLLER HOLDER ASS'Y S.S	2
24	1AUD0800	AP ROLLER HOLDER ASS'Y	1
25	66001292	AP ROLLER HOLDER (R) ASS'Y S.S	2
26	1AUD2800	AP ROLLER HOLDER (R) ASS'Y	1
27	66001292	AP ROLLER HOLDER (S) S.S	2
28	1AU34200	AP ROLLER (S)	1
29	1AU34300	AP ROLLER HOLDER (S)	1
30	1AU30200	RAIL PLATE	1
31	1AU30400	BL PLATE (1)	1
32	1AU30700	BL PLATE (1) SPRING	1
33	1AU30900	BL PLATE S.S (1)	2
34	1AU29100	DARK SLIDE LIGHT-SHIELD MOQUETTE	2
35	1AU30500	BL PLATE (2)	1
36	66001049	BL PLATE (2) S.S	1
37	1AU44200	DARK SLIDE PLUSH PLATE (1)	1
38	1AU29700	CD PLATE	1
39	61901626	DARK SLIDE PLUSH PLATE (1) S.S	3
40	1AU44100	DARK SLIDE PLUSH	1
41	1AU29100	DARK SLIDE LIGHT-SHIELD TAPE	1

The parts names with * mark is not supplied as a repair parts.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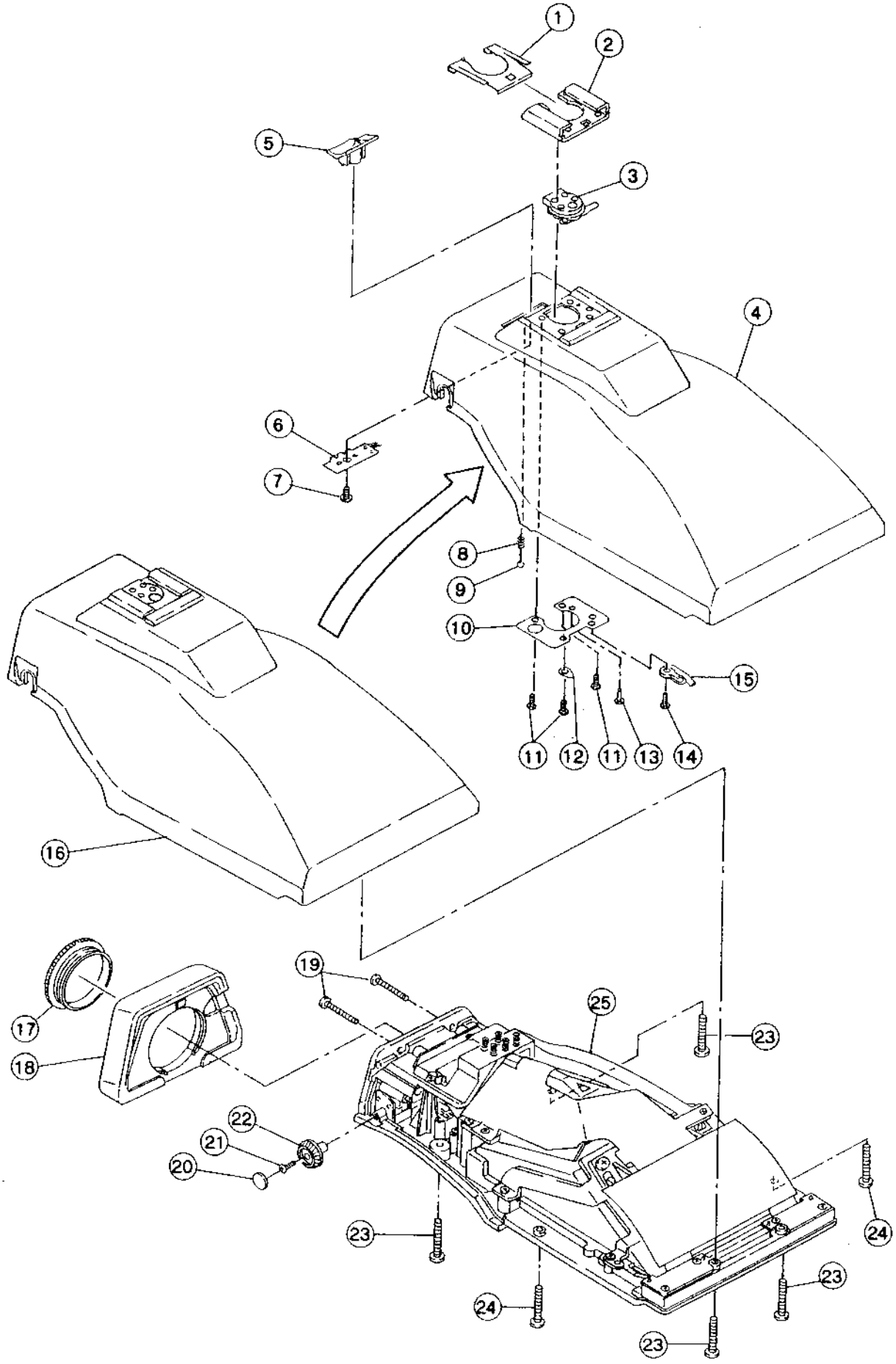
	PARTS No.	DESCRIPTION	QTY
1	*	DOUBLE-STICK TAPE	2
2	1AU43600	FILM INSERT CONTACT SPRING (R)	1
3	*	FILM BOX	1
4	1AU16000	B. LIGHT-SHIELD TAPE (1)	1
5	1AU44800	FB LIGHT-SHIELD MOQUETTE	1
6	69113576	BF STOPPER S.S	2
7	1AU32200	BF STOPPER	1
8	69113576	FILM COUNTER MARK S.S	1
9	1AU32300	FILM COUNTER MARK	1
10	66001247	FB SWITCH FPC S.S	4
11	1AU53200	FB SWITCH FPC	1
12	1AUD1400	C. GEAR ASS'Y	1
13	1AU39400	C. GEAR SPRING	1
14	1AU39500	C. GEAR RETAINER	1
15	69114076	C. GEAR RETAINER S.S	1
16	1AU39100	FB TAPE (1)	1
17	1AUD1300	C. STOPPER ASS'Y	1
18	1AU38700	C. STOPPER SPRING	1
19	1AUD2600	C. BASE PLATE (K) ASS'Y	1
20	69114076	C. BASE PLATE ASS'Y S.S	3
21	63901826	SOLENOID PLUNGER S.S	2
22	1AUD1700	C. RESET LEVER ASS'Y	1
23	66101225	E RING (E-1.2)	2
24	1AU39000	C. RESET SPRING	1
25	63912026	C. LEVER ADJUSTING PLATE S.S	1
26	1AU54100	SOLENOID PLUNGER	1
27	1AUD1600	C. LEVER ADJUSTING PLATE	1
28	1AU43500	FILM INSERT CONTACT SPRING (L)	1
29	1AU36400	P. GEAR (3)	1
30	66001227	P. GEAR (3) S.S	1
31	1AU36600	P. GEAR (5)	1
32	1AU36500	P. GEAR (4)	1
33	1AU36900	P. GEAR SPRING	1
34	1AU36700	P. GEAR (6)	1
35	1AUD1100	C. RATCHET ASS'Y	1
36	1AU38100	C. LEVER SPRING	1
37	1AU38400	C. RATCHET SPRING	1
38	1AUD1000	FW BASE PLATE (K) ASS'Y	1
39	3CU16600	CONDUCTION SUB PLATE	1
40	*	ACETATE CLOTH TAPE	1
41	69313076	FW BASE PLATE (K) ASS'Y S.S	3
42	1AU35200	FW GEAR (2)	1
43	1AU44500	FW GEAR (3) ASS'Y	1
44	1AU44600	FW GEAR (5) ASS'Y	1
45	66001298	FW GEAR (5) ASS'Y S.S	1
46	1AU35100	FW GEAR (1)	1
47	69314076	P. BASE PLATE ASS'Y S.S	1
48	66001190	BF FOOT S.S	1
49	1AU37000	BF FOOT	1
50	1AUD0400	BF LEVER (K) ASS'Y	1
51	69113576	P. BASE PLATE ASS'Y S.S	1
52	1AUD0200	P. BASE PLATE (K) ASS'Y	1
53	1AU36300	P. GEAR (2)	1
54	1AU36200	P. GEAR (1)	1
55	66001274	P. GEAR (1) S.S	1
56	1AU37400	BF LEVER SPRING	1
57	1AU36100	V. CONTACT	2
58	69112566	V. CONTACT S.S	4
59	61911226	FB PC-FPC ASS'Y S.S	1
60	1AUCE100	FB PC-FPC ASS'Y	1
61	1AU39300	FB TAPE (2)	1
62	1AU37700	FB TAPE (3)	1
63	1AU33300	DM LENS	1
64	1AU34000	DM MASK	1
65	1AUCE500	FB MAIN FPC ASS'Y	1
66	1AU33600	PR RETAINING PLATE	1
67	69212276	PR RETAINING PLATE S.S	1
68	69112566	DM RETAINING PLATE S.S	2
69	61911226	FB MAIN FPC ASS'Y S.S	1

The parts names with * mark are not supplied as a repair parts.

No.11

REF No.1AU

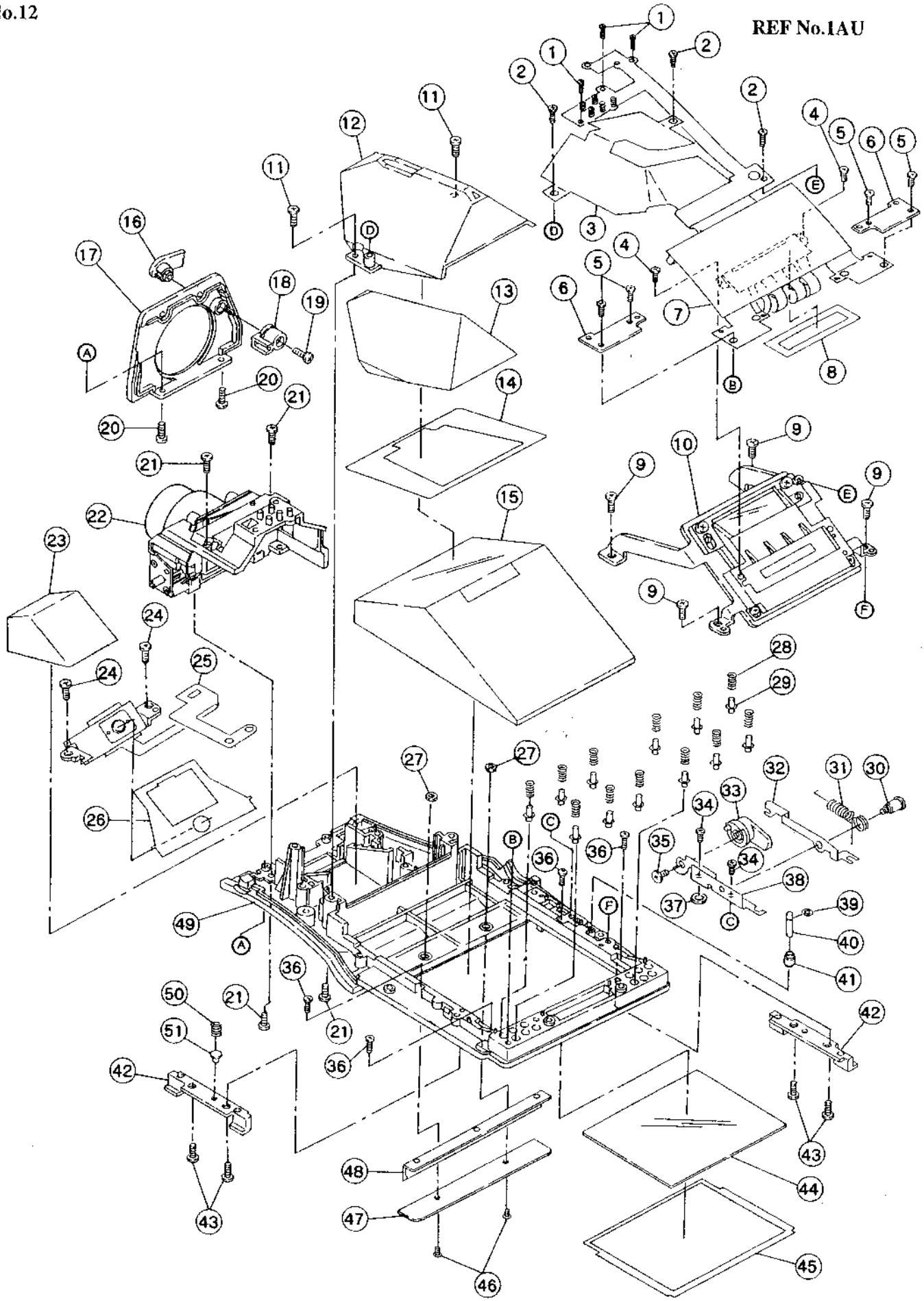


	PARTS No.	DESCRIPTION	QTY
1	1AM20300	SHOE PLATE SPRING	1
2	1AM20200	ACCESSORY SHOE	1
3	1AWB6400	SHOE CONTACT ASS'Y	1
4	*	FINDER COVER	1
5	1AU85100	METERRING SWITCH LEVER	1
6	1AUG1100	METERRING SWITCH PLATE ASS'Y	1
7	69113576	METERRING SWITCH PLATE ASS'Y S.S	1
8	1AU85500	METERRING SWITCH SPRING	1
9	66701220	STEEL BALL (ϕ1.2)	1
10	1AU83900	SHOE HOLDING PLATE	1
11	61913022	SHOE HOLDING PLATE S.S	3
12	3CU16600	CONDUCTIOM SUB PLATE	1
13	13917600	SHOE CONTACT PLATE PIN	1
14	61914026	SHOE CONTACT PLATE (1) ASS'Y S.S	1
15	1AQ27400	SHOE CONTACT PLATE (1) ASS'Y	1
16	1AUG1000	FINDER COVER ASS'Y	1
17	1AU88200	EYEPIECE RING	1
18	1AUG1300	EYECUP ASS'Y	1
19	66001170	FINDER COVER S.S	2
20	1AA85600	DIOPTRIC ADJUSTMENT KNOB PLATE	1
21	66001055	DIOPTRIC ADJUSTMENT KNOB S.S	1
22	1AH88600	DIOPTRIC ADJUSTMENT KNOB	1
23	66001120	FINDER COVER S.S	4
24	69228076	FINDER COVER S.S	2
25	*	FINDER BASE (See Page No.12)	1

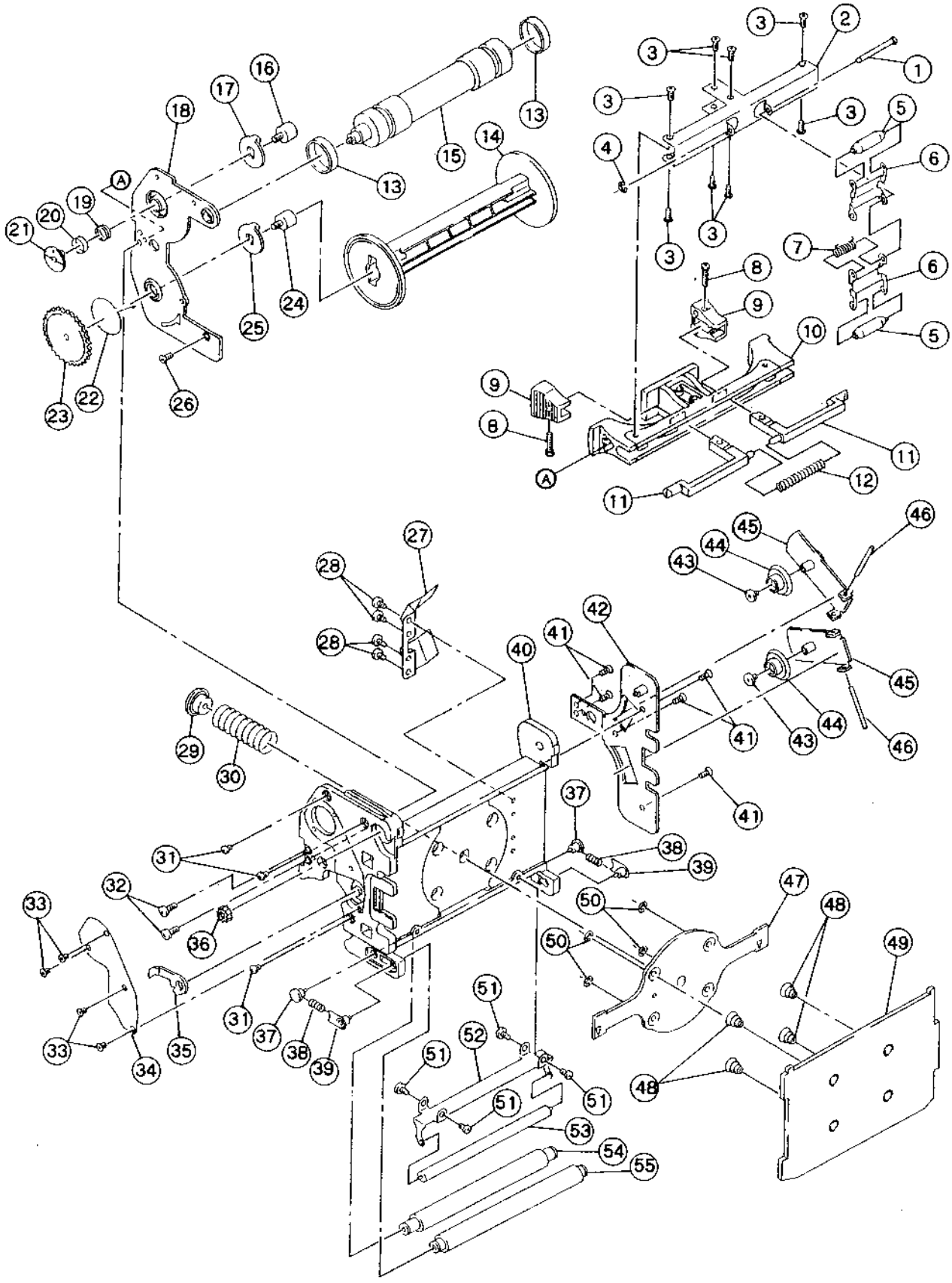
The parts names with * mark are not supplied as a repair parts.

No.12

REF No.1AU



	PARTS No.	DESCRIPTION	QTY
1	69103076	FINDER FPC ASS'Y S.S	3
2	69113076	FINDER FPC ASS'Y S.S	3
3	1AUGE300	FINDER FPC ASS'Y	1
4	69114076	F. LCD HOLDING BASE S.S	2
5	69114076	FINDER CONTACT RETAINER S.S	4
6	1AU80900	FINDER CONTACT RETAINER	2
7	1AU88900	F. INSULATING TAPE	1
8	1AU81700	F. LCD MASK	1
9	69215076	PRISM A HOLDER ASS'Y S.S	4
10	1AUG0300	PRISM A HOLDER ASS'Y	1
11	69215076	PRISM B HOLDER ASS'Y S.S	2
12	1AUG0500	PRISM B HOLDER ASS'Y	1
13	1AU89400	PRISM B	1
14	1AU88300	PRISM A MASK	1
15	1AU89300	PRISM A	1
16	1AU88000	EYEPIECE SHUTTER OPERATING LEVER	1
17	1AU80300	EYEPIECE COVER	1
18	1AU87700	EYEPIECE SHUTTER LEVER	1
19	69215076	EYEPIECE SHUTTER LEVER S.S	1
20	66001124	EYEPIECE COVER S.S	2
21	69215076	EYEPIECE BASE (1) ASS'Y S.S	4
22	1AGG0600	EYEPIECE BASE (1) ASS'Y	1
23	1AU89500	PRISM C	1
24	69214076	F. LIGHT-METERING HOLDER ASS'Y S.S	2
25	1AUG0200	F. LIGHT-METERING HOLDER ASS'Y	1
26	1AU88600	PRISM B MASK	1
27	66511722	HEXAGON NUT	2
28	1AU80800	FINDER CONTACT SPRING	12
29	1AU80700	FINDER CONTACT PIN	12
30	1AU82700	F. LOCK LEVER SHAFT	1
31	1AU82500	F. LOCK SPRING	1
32	1AU82300	F. LOCK LINK (1)	1
33	1AU82800	F. LOCK LEVER	1
34	69113076	F. LOCK BASE S.S	2
35	66001223	F. LOCK LEVER S.S	1
36	63916026	FINDER BASE S.S	4
37	60111810	WASHER	1
38	1AU82200	F. LOCK BASE	1
39	66101225	E RING (E-1.2)	1
40	1AU82000	F. LOCK PIN	1
41	1AU82100	F. LOCK PIN SLEEVE	1
42	1AU80500	FINDER RAIL	2
43	69115076	FINDER RAIL S.S	4
44	1AU89100	F. PROTECTING GLASS	1
45	1AU89200	F. PROTECTING GLASS MASK	1
46	61812529	F. RUBBER RETAINING PLATE S.S	2
47	1AU83100	F. RUBBER RETAINING PLATE	1
48	1AU83000	F. RUBBER	1
49	1AU80100	FINDER BASE	1
50	1AU81100	FS RETAINING SPRING	1
51	1AU81000	FS RETAINING PIN	1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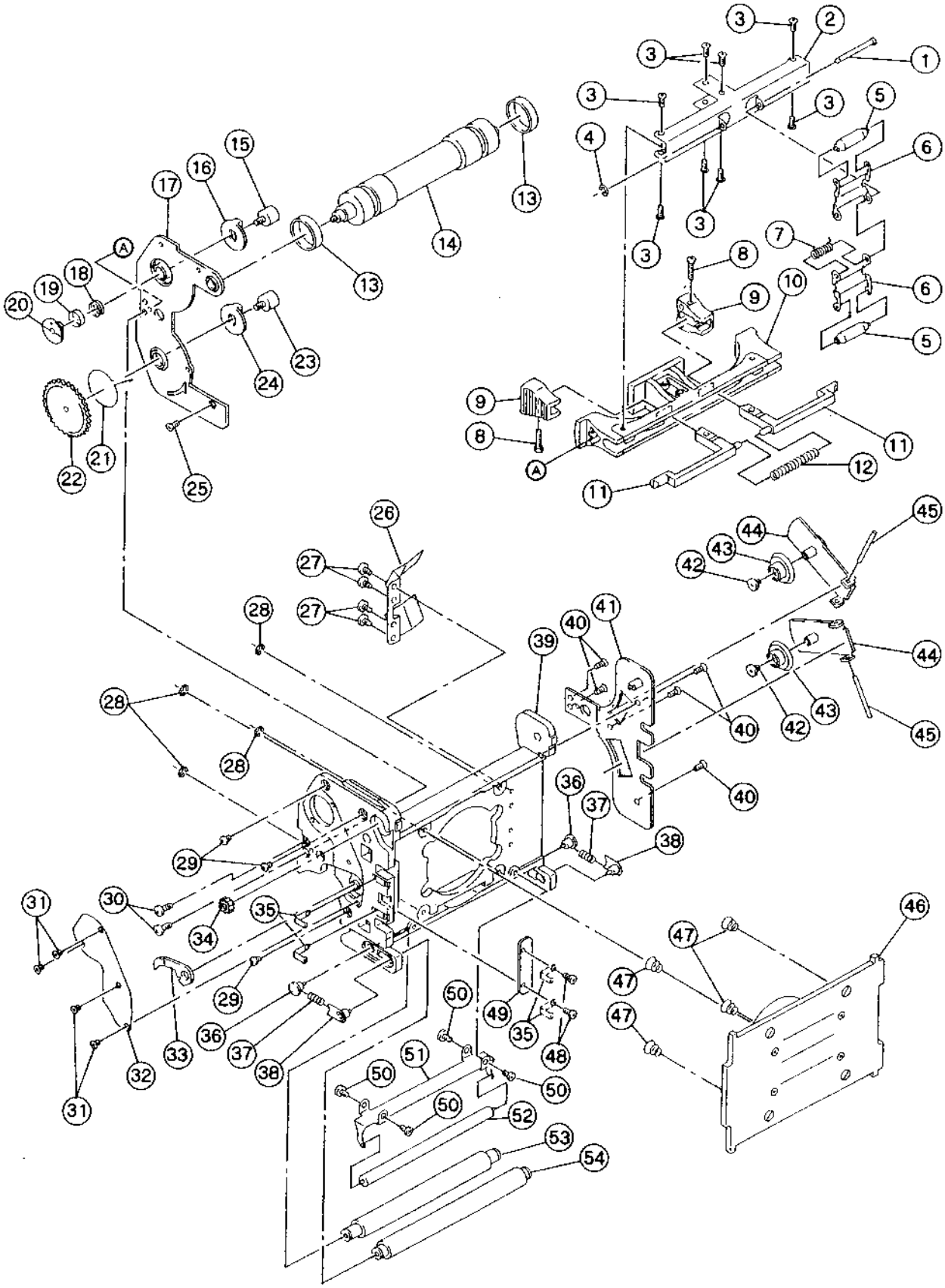
	PARTS No.	DESCRIPTION	QTY
1	1AU48500	F. RETAINING ROLLER SHAFT	1
2	1AU48600	F. RETAINING ROLLER BASE PLATE	1
3	66001263	F. RETAINING ROLLER BASE PLATE S.S	8
4	66101230	E RING (E-1.2)	1
5	1AU48200	F. RETAINING ROLLER	2
6	1AU48300	F. RETAINING ROLLER PLATE	2
7	1AU48400	F. RETAINING ROLLER SPRING	1
8	69116576	ROCK KNOB S.S	2
9	1AU49000	ROCK KNOB	2
10	1AU48800	ROCK BASE	1
11	1AU48900	ROCK ARM	2
12	1AU49100	ROCK ARM SPRING	1
13	1AU45200	F. ROLLER RING	2
14	1AU92000	SPOOL	1
15	1AU46000	F. ROLLER (1)	1
16	1AU46700	SPOOL DRIVER SHAFT	1
17	1AU47100	SPOOL DRIVER	1
18	*	F. ROLLER BASE PLATE	1
19	1AU47500	SPOOL FRICTION SPRING	1
20	1AU29900	SPOOL FRICTION COLLAR	1
21	1AU47400	SPOOL FRICTION S.S	1
22	1AU47000	SPOOL GEAR SPRING	1
23	1AU46900	SPOOL GEAR	1
24	1AU46700	SPOOL DRIVER SHAFT	1
25	1AU47100	SPOOL DRIVER	1
26	69313576	F. ROLLER BASE PLATE ASS'Y S.S	1
27	1AU49700	SPOOL RETAINING SPRING	1
28	69212566	SPOOL RETAINING SPRING S.S	4
29	1AU46600	PRESSURE PLATE CENTER SCREW	1
30	1AU45800	PRESSURE PLATE CENTER SPRING	1
31	61912029	FILM INSERT CHASSIS S.S	3
32	66001124	FILM INSERT CHASSIS S.S	2
33	66001247	S. RATCHET COVER S.S	4
34	1AU47800	S. RATCHET COVER	1
35	1AU47700	S. RATCHET	1
36	1AU46200	F. ROLLER GEAR	1
37	1AU47900	F. ROLLER (3) SHAFT	2
38	1AU49200	F. ROLLER (2) SPRING	2
39	1AUK2200	F. ROLLER (2) BASE PLATE	2
40	1AUK2000	FILM INSERT CHASSIS ASS'Y	1
41	69313569	SPOOL RETAINING BASE PLATE ASS'Y S.S	5
42	1AUK1800	SPOOL RETAINING BASE PLATE ASS'Y	1
43	66001298	SPOOL RETAINING ROLLER S.S	2
44	1AU49400	SPOOL RETAINING ROLLER	2
45	*	SPOOL RETAINING PLATE	2
46	66671330	PARALLEL PIN	2
47	1AUK2100	PRESSURE PLATE BASE ASS'Y	1
48	1AU45700	PRESSURE PLATE SPRING	4
49	*	PRESSURE PLATE	1
50	66101230	E RING (E-1.2)	4
51	69113026	F. ROLLER (4) BASE PLATE S.S	4
52	1AU49600	F. ROLLER (4) BASE PLATE	1
53	1AU47600	F. ROLLER (4)	1
54	1AUK2300	F. ROLLER (3) ASS'Y	1
55	1AUK1300	F. ROLLER (2) ASS'Y	1
16-21	1AUK1100	F. ROLLER BASE PLATE ASS'Y	1
43-45	1AUK1700	SPOOL RETAINING PLATE ASS'Y	2
47-50	1AUK1400	PRESSURE PLATE ASS'Y	1

The parts names with * mark are not supplied as a repair parts.

REF No.2DE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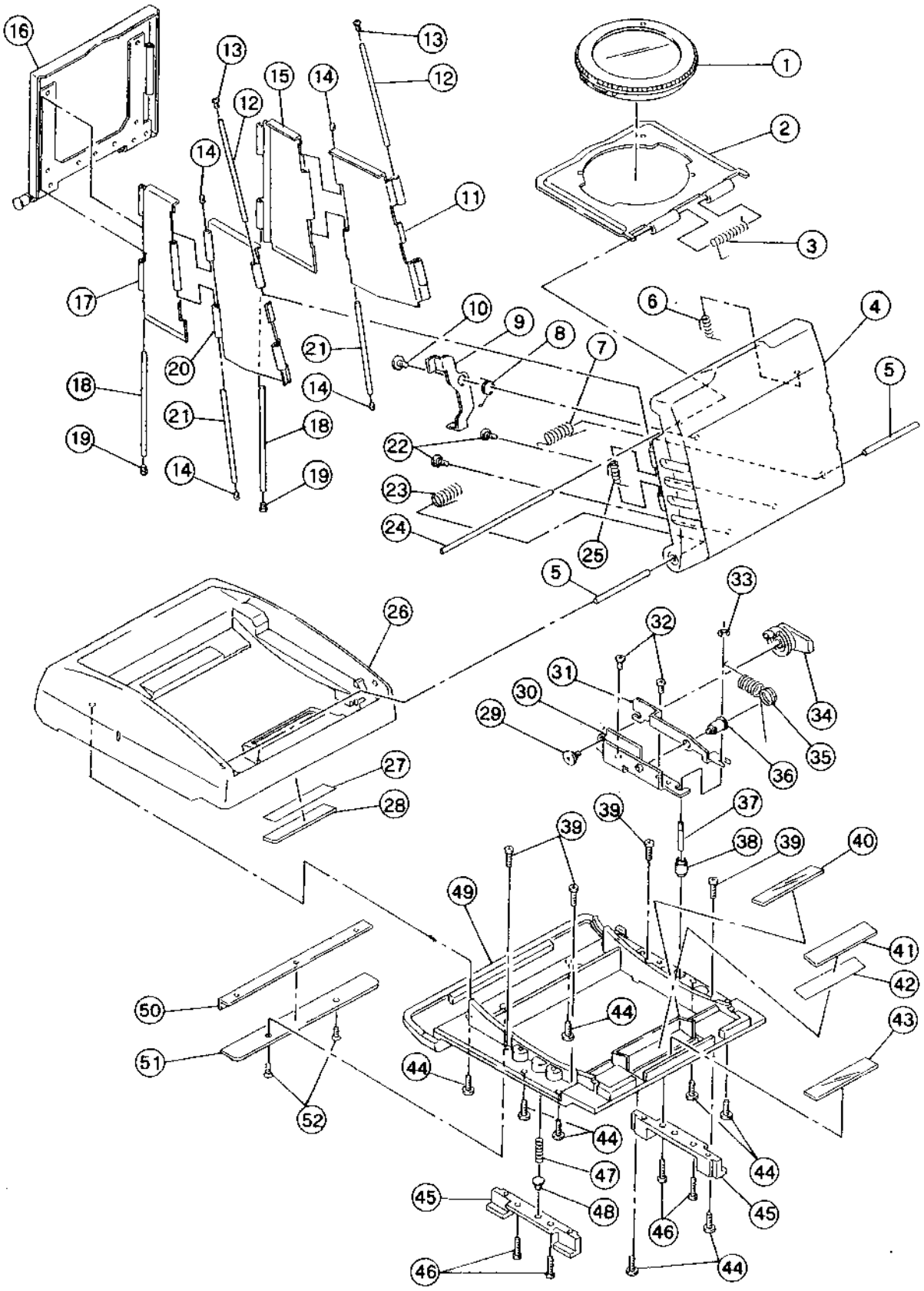
	PARTS No.	DESCRIPTION	QTY
1	1AU48500	F. RETAINING ROLLER SHAFT	1
2	1AU48600	F. RETAINING ROLLER BASE PLATE	1
3	66001263	F. RETAINING ROLLER BASE PLATE S.S	8
4	66101230	E RING (E-1.2)	1
5	1AU48200	F. RETAINING ROLLER	2
6	1AU48300	F. RETAINING ROLLER PLATE	2
7	1AU48400	F. RETAINING ROLLER SPRING	1
8	69116576	ROCK KNOB S.S	2
9	1AU49000	ROCK KNOB	2
10	2DE11300	V. LOCK BASE	1
11	1AU48900	ROCK ARM	2
12	1AU49100	ROCK ARM SPRING	1
13	1AU45200	F. ROLLER RING	2
14	1AU46000	F. ROLLER (1)	1
15	1AU46700	SPOOL DRIVER SHAFT	1
16	1AU47100	SPOOL DRIVER	1
17	*	F. ROLLER BASE PLATE	1
18	1AU47500	SPOOL FRICTION SPRING	1
19	1AU29900	SPOOL FRICTION COLLAR	1
20	1AU47400	SPOOL FRICTION S.S	1
21	1AU47000	SPOOL GEAR SPRING	1
22	1AU46900	SPOOL GEAR	1
23	1AU46700	SPOOL DRIVER SHAFT	1
24	1AU47100	SPOOL DRIVER	1
25	69313576	F. ROLLER BASE PLATE ASS'Y S.S	1
26	1AU49700	SPOOL RETAINING SPRING	1
27	69212566	SPOOL RETAINING SPRING S.S	4
28	66101230	E RING (E 1.2)	4
29	61912029	V. FILM INSERT CHASSIS S.S	3
30	66001124	V. FILM INSERT CHASSIS S.S	2
31	66001247	S. RATCHET COVER S.S	4
32	1AU47800	S. RATCHET COVER	1
33	1AU47700	S. RATCHET	1
34	1AU46200	F. ROLLER GEAR	1
35	2DE11100	V. FILM INSERT CONTACT	2
36	1AU47900	F. ROLLER (3) SHAFT	2
37	1AU49200	F. ROLLER (2) SPRING	2
38	1AUK2200	F. ROLLER (2) BASE PLATE	2
39	2DEB0100	V. FILM INSERT CHASSIS ASS'Y	1
40	69313569	SPOOL RETAINING BASE PLATE ASS'Y S.S	5
41	1AUK1800	SPOOL RETAINING BASE PLATE ASS'Y	1
42	66001298	SPOOL RETAINING ROLLER S.S	2
43	1AU49400	SPOOL RETAINING ROLLER	2
44	*	SPOOL RETAINING PLATE	2
45	66671330	PARALLEL PIN	2
46	2DEB0200	VACUUM UNIT ASS'Y	1
47	2DE10800	V. PRESSURE PLATE SPRING	4
48	69103066	V. FILM INSERT CONTACT S.S	2
49	2DE11200	V. BOARD	1
50	69113026	F. ROLLER (4) BASE PLATE S.S	4
51	1AU49600	F. ROLLER (4) BASE PLATE	1
52	1AU47600	F. ROLLER (4)	1
53	1AUK2300	F. ROLLER (3) ASS'Y	1
54	1AUK1300	F. ROLLER (2) ASS'Y	1
15-20	1AUK1100	F. ROLLER BASE PLATE ASS'Y	1
42-44	1AUK1700	SPOOL RETAINING PLATE ASS'Y	2

The parts names with * mark are not supplied as a repair parts.

REF No.2KL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	PARTS No.	DESCRIPTION	QTY
1	2KLB0400	WLF LENS ASS'Y	1
2	2KLB0600	TOP LIGHT-SHIELD PLATE ASS'Y	1
3	2KL11600	TOP LIGHT-SHIELD SHAFT SPRING	1
4	2KL11100	WLF LIGHT-SHIELD COVER	1
5	2KL11200	WLF LIGHT-SHIELD COVER SHAFT	2
6	2KL12200	FRONT LIGHT-SHIELD PLATE SPRING	1
7	2KL11000	LIGHT-SHIELD COVER RIGHT SPRING	1
8	2KL12000	F. LENS LATCH LEVER SPRING	1
9	2KL11800	F. LENS LATCH LEVER	1
10	66001185	F. LENS LATCH LEVER S.S	1
11	2KL10600	RIGHT FRONT LIGHT-SHIELD PLATE	1
12	2KL11300	FRONT LIGHT-SHIELD PLTE SHAFT	2
13	61901826	FRONT LIGHT-SHIELD PLTE SHAFT S.S	2
14	66001139	FRONT REAR LIGHT-SHIELD PLATE SHAFT S.S	4
15	2KL10800	RIGHT REAR LIGHT-SHIELD PLATE	1
16	2KL16100	REAR HINGE PLATE ASS'Y	1
17	2KL10700	LEFT REAR LIGHT-SHIELD PLATE	1
18	2KL11900	REAR LIGHT-SHIELD PLATE SHAFT	2
19	61901826	REAR LIGHT-SHIELD PLATE SHAFT S.S	2
20	2KL10500	LEFT FRONT LIGHT-SHIELD PLATE	1
21	2KL12100	FRONT REAR LIGHT-SHIELD PLATE SHAFT	2
22	66001246	WLF LIGHT-SHIELD COVER S.S	2
23	2KL10900	LIGHT-SHIELD COVER LEFT SPRING	1
24	2KL11500	TOP LIGHT-SHIELD PLATE SHAFT	1
25	2KL12300	LEFT FRONT LIGHT-SHIELD PLATE SPRING	1
26	2KL10Z00	WLF COVER	1
27	2KL13800	MIRROR TAPE	1
28	2KL13500	WLF MIRROR	1
29	66001223	F. LOCK LEVER S.S	1
30	1AU82200	F. LOCK BASE	1
31	1AU82300	F. LOCK LINK (1)	1
32	69313076	F. LOCK BASE S.S	2
33	66101225	E RING (E-1.2)	1
34	1AU82800	F. LOCK LEVER	1
35	1AU82500	F. LOCK SPRING	1
36	1AU82700	F. LOCK LEVER SHAFT	1
37	1AU82000	F. LOCK PIN	1
38	1AU82100	F. LOCK PIN SLEEVE	1
39	61916026	WLF BASE S.S	4
40	2KL13700	WLF-LCD WINDOW (2)	1
41	2KL13500	WLF MIRROR	1
42	2KL13800	MIRROR TAPE	1
43	2KL13600	WLF-LCD WINDOW (1)	1
44	69215076	WLF BASE S.S	8
45	1AU80500	FINDER RAIL	2
46	69116076	FINDER RAIL S.S	4
47	1AU81100	FS RETAINING SPRING	1
48	1AU81000	FS RETSINING PIN	1
49	2KL10100	WLF BASE	1
50	1AU83000	F. RUBBER	1
51	1AU83100	F. RUBBER RETAINING PLATE	1
52	69313079	F. RUBBER RETAINING PLATE S.S	2